

FLIGHT

&
The AIRCRAFT
ENGINEER.

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.
OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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Index and Title Page for Vol. IX.

The 8-page Index for Vol. IX of "FLIGHT" (January to December, 1917) is now ready, and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C. 1. Price 6d. per copy, post free.

NOTICE OF REMOVAL.

The Offices—Editorial and Advertisement—of
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36, GREAT QUEEN STREET, KINGSWAY, W.C. 2.

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Telegraph Address: "Truditur, Westcent, London."

EDITORIAL COMMENT.

"Newspapers are an essential part of our war organisation."—
(Sir Auckland Geddes, Minister of National Service.)



WITH reference to our article under this heading, published in last week's issue of "FLIGHT," certain of the conclusions reached therein have been challenged by the London and Provincial Coachworkers' Trade Union, most of whose members who are not

serving with the armed forces of the Crown are engaged in aircraft construction, principally if not altogether as woodworkers. Therefore,

"Trade Union Methods and Production." The main ground upon which objection is lodged is regarding our statement that as a general rule the piece-workers engaged in aircraft construction are not working to more than 60 per cent. of their maximum productive capacity. This, we are assured, is not the case. So far as the Union itself

is concerned, the executive is as anxious as anyone that production should be speeded up to the "100 per cent." basis, and all its efforts are being directed towards that end. That also, after a lengthy discussion with the Union's officials, we believe to be the case. But after all is said and done, we can see no reason to modify the statement we made to the effect that there is in fact a substantial margin between actual and possible production of aircraft, and that margin, we still believe, is due to restriction of output which is deliberate. Let us be clear that we are not laying the blame at the door of the woodworkers in particular, nor do we accuse any other individual section of the workers of a laxity of effort due to want of patriotic feeling. Our specific statement was, and is now, that there is restriction of output amounting approximately to 40 per cent. of the possible maximum.

The question is how and why this restriction of output is operative. To all appearance it is mainly due to a factor which emerged in the course of our discussion with the officials of the Union mentioned. "There is one thing," we were told, "to which you must make up your minds, and that is if you want maximum output the employers must get rid of their fear of high wages." There is no doubt there is more than a little behind this. To drive home the point we were shown the documents of the case in a dispute between a well-known firm of motor-car manufacturers and the coachworkers' union. From these it appeared that the firm in question were asked to make propellers for aircraft, and accepted a contract after having enquired from others already engaged on similar work as to the costs of production. The men were asked to set about the making, as an experiment, of a few propellers at a certain price, which worked out satisfactorily to both sides. The firm then offered a price of 10s. per propeller less for

400, which was accepted. By the time the end of this number was reached the men had become fairly expert at the job and were making good wages—some of them as high as £7 per week. Then the firm tried to cut the rate, and, naturally enough, there was trouble, and in the end the Chief Industrial Commissioner's aid had to be invoked. Now, we have little or no sympathy with the class of men who have made their country's need their opportunity for outrageous demands, with the threat to "down tools" if everything they demand is not conceded, but we confess at the same time we have as little sympathy with the employer who tries to get out of a bargain with his workers for the sake of putting extra profits into his own pocket. It is not only that the act itself is perilously near the immoral, but it most certainly tends to bring about that very restriction of output which the employer himself is the first to deplore. It is quite easy to see the point of view of the workers and their representatives. Why, they ask, should they be required to turn out ten articles for a certain payment when, by taking things more easily, they can get the same money for seven? Or, to put it another way, if the employer whose factory is run on the piecework system, has fixed in his mind a maximum wage beyond which he objects to pay his men, why should output not be restricted to a point which will keep the workers within that maximum rather than put in that extra effort which will bring wages above the fixed point and thus invite a reduction of the piecework rates? This seems to us to be where the shoe pinches.

Figures have been submitted to us which show that since the premium bonus system was put into operation in May of last year in one of the largest factories in the Midlands, production has increased by more than 100 per cent. all round. (Mr. Kellaway, the Parliamentary Secretary of the Ministry of Munitions, gave some figures in the House on Monday on the increase of production resulting from the premium bonus system. These increases are—Guns, 48 per cent.; machine-guns, 20 per cent.; aeroplanes, 42 per cent.; aeroplane engines, 68 per cent.; shipbuilding material, 25 per cent.) That is eminently satisfactory as far as it goes, but there are two inevitable reflections that arise out of it. The first is that there must have been an appalling amount of slacking going on while the daywork system was in operation in the same factory, and when we attempt to translate this into terms of machines that we might have had at the Front but did not on account of the slacking, we are simply aghast that men could so let down their fellows who are fighting for them in the trenches. There is only one term that can justly be applied—criminal, and even that is not strong enough. Allowing that there is approximate correctness in the statement that output is still 40 per cent. below maximum, then it follows the original production before the premium bonus system was brought into effect was a little more than one-third of the possible maximum. The figures speak for themselves. The second reflection is that it is quite clear that if we want to see our factories working to maximum capacity the whole of the questions relating to labour and its reward will have to be organised and put on a substantial and permanent basis. Probably the best means of achieving this would be by the appointment of a Board on the lines of those suggested by the Whitley Report. One thing is quite clear, and that is that in spite of all the conferences between Government Departments, em-

ployers and workers, the position is still very far from satisfactory. When each side has presented its case it becomes manifest that there still exists a great deal of mutual suspicion and distrust. As to which side is mostly to blame for this we do not at the moment presume to say, but this much is certain, that not only for the purposes of the war but for the sake of British industry and commerce afterwards these mists of doubt and suspicion will have to be cleared away, else we shall never recover our position in the world of trade.

Ireland and Aircraft Manufacture.

The distressful country has another grievance! Some weeks ago it became known that the Government had given some measure of attention to Ireland as a possible factor in aircraft construction, and Irish manufacturers and workers were delighted at the prospect of the sister isle obtaining at last what they call her "fair share" of war work. Now it seems that the Air Council has decided otherwise, and for the present, at least, there is no intention of building aircraft factories on the other side of the St. George's Channel, nor, apparently, are contracts to be placed with Irish firms. The attitude of the Air Council is summed up in a communication from the Hotel Cecil to the All-Ireland Munitions and Government Supplies Committee to the effect that the Council's requirements for aeroplanes are fully placed at present, but the matter of Ireland and Irish facilities was being kept in view should opportunity arise for utilisation in future.

This communication has raised a storm of protest from the Irish newspapers. The *Freeman's Journal*, among others, is terribly annoyed about it, and says: "We are told every day that the need of men for the Army is intensifying the problem of skilled labour for war-work in Great Britain. In this crisis Ireland offers her help. Her manufacturers can find ample employment for a satisfactory supply of skilled labour. The Government can supply the necessary machinery here as easily as it supplies such machinery in England. Some of our firms have already all the machinery that is required. Indeed, we know of one case where an English manufacturer sought to borrow machinery from one of the Irish firms to which contracts are still refused. This state of affairs is an injustice to Ireland, and—what is more serious at the present time—it is an injustice to the British Army in France."

We do not intend to discuss the decision of the Air Council in terms of expediency. That decision may be right, or it may be wrong, as the case may be. On the balance of probabilities it is assumedly right, inasmuch as the Council knows the programme of construction decided upon, and how our manufacturing facilities stand in relation to it. The Council has, as a plain matter of business, determined that, for the present at any rate, it has no need of the facilities offered by Ireland. And, so far as we are able to see, that is the only factor that really matters. What does appeal to us as being distinctly humorous is the reference to "another injustice to Ireland." We fail to see it. Ireland complains that she is not getting her fair share of war contracts. Well, what is her fair share? We do not know, nor are we going to try to work out a basis of proportionment of war contracts which would be "fair" to the point at which our Irish contemporary would express itself satisfied that "justice" had been done. But we



AVANTI AVANTI!...
LA VITTORIA GUIDA I NOSTRI ESERCITI
FATE TUTTI IL VOSTRO DOVERE
SOTTOSCRIVETE AL V° PRESTITO NAZIONALE

From text on the
grounded line
of the National Loan

An Italian appeal to subscribers to Italy's National Loan is published by "La Via Azzura," the legend being "Onward, onward! Victory guides our efforts. Dedicate all your efforts (it is your duty) to subscribe to [the National Loan.]"

really cannot refrain from pointing out that even if Ireland has no aeroplane contracts, there are certain other things in which she is equally lacking. True, we have aeroplane contracts in England—but we also have conscription, which Ireland has not. Then, the point is made that the fact of Ireland having no contracts to build aircraft is “an injustice to the British Army in France.” Well, there is no need for our contemporary to unduly vex itself about that. There are other injustices to the British Army in France, and not least among those injustices is the fact that there are at the present moment some quarter of a million or more young Irishmen of military age swaggering about Ireland in civilian clothes, secure from the military service which is enforced upon Englishmen, Scotsmen, and Welshmen, to say nothing of our Canadian brothers across the seas. We might advance other illustrations of matter that affect us here in England but which have no application to Ireland, such, for example, as food and drink restrictions, but these are of relatively minor importance. We should advise the *Freeman's Journal* to try another tack. By all means argue that the decision of the Air Council is bad from the business point of view, or is against public policy or something of that sort, but to construe a decision of the kind into an “injustice” to Ireland, is in all the circumstances, simply grotesque.

**Government
Waste of
Paper.**

The disclosures made in the Report of the Select Committee to enquire into the expenditure on stationery and printing for the House of Commons and the public service generally help to bring home to the public the appalling waste of money that seems inseparable from Government administration. In one department alone—the name of which is not stated, more is the pity—it is recorded that some 62 tons of paper had to be thrown away because someone had ordered huge supplies of posters and leaflets, without any regard to the numbers that might be required. The orders, moreover, were not, it is stated, given in competition, so that the lowest prices were not obtained. This is only one example of the methods pursued by the Government departments in a time when the unfortunate civilian is being adjured by all he holds holy to save paper, and when useful publications are at their wits' end to get enough paper to go round. The newspapers are restricted down to the last possible ream of paper—and the Food Ministry, as a result of panic, issues a stupidly useless sugar card and has to get it reprinted! No newspaper may use a sheet of paper by way of a contents' bill—and a Government Department wastes over 60 tons as a result of action which no business manager could take and keep his post. It is all too tragic.



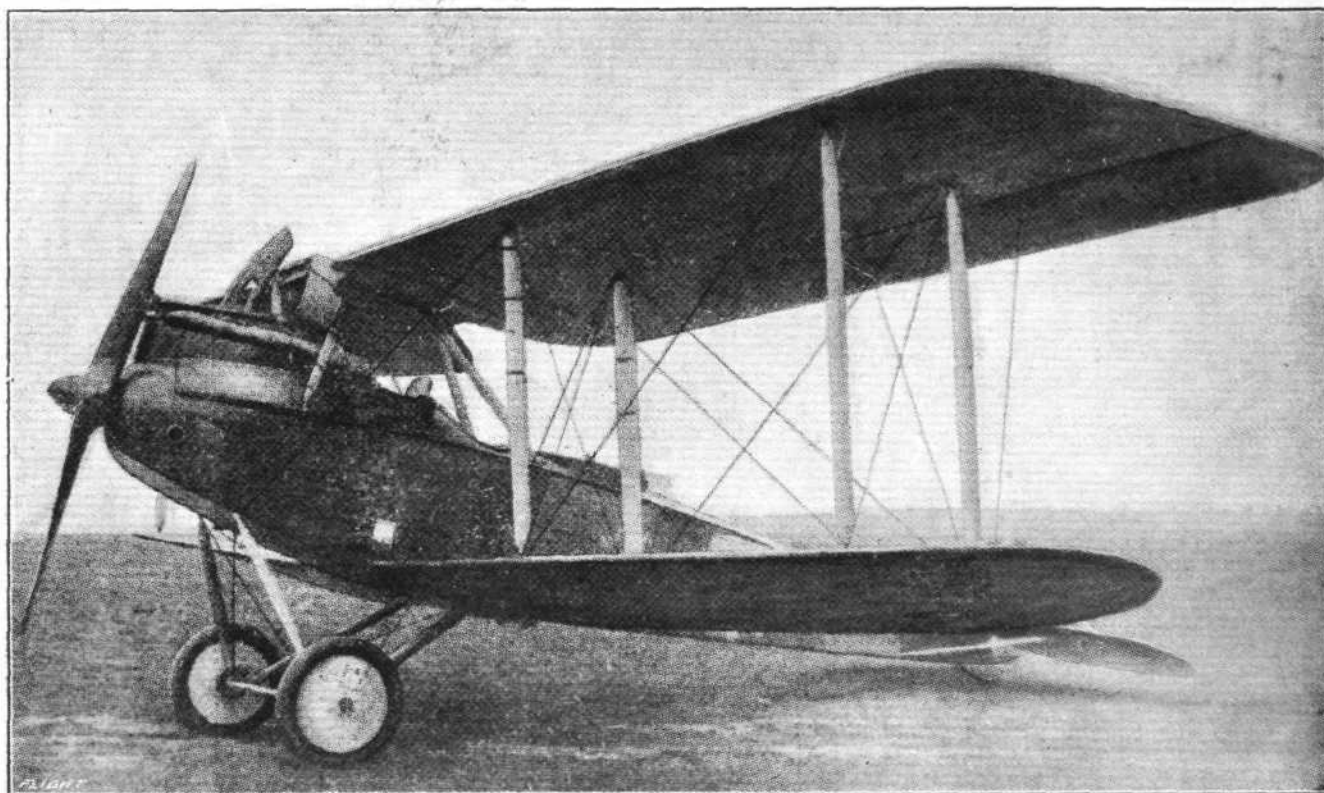
“British Official.”

A Scout aeroplane on the British Western Front being prepared for a moonlight flight.

THE C. IV RUMPLER BIPLANE.

THE Rumpler biplane described below belongs to the C class of enemy aeroplanes. That is to say, it is a general utility machine, and is perhaps the best in its class. It is chiefly of interest on account of its great

and the wings are staggered forward 0.60 metres. The trailing edge, contrary to usual German practice, is rigid. The ribs, which are made of three-ply wood, pierced for lightness, are spaced 0.30 metres apart.

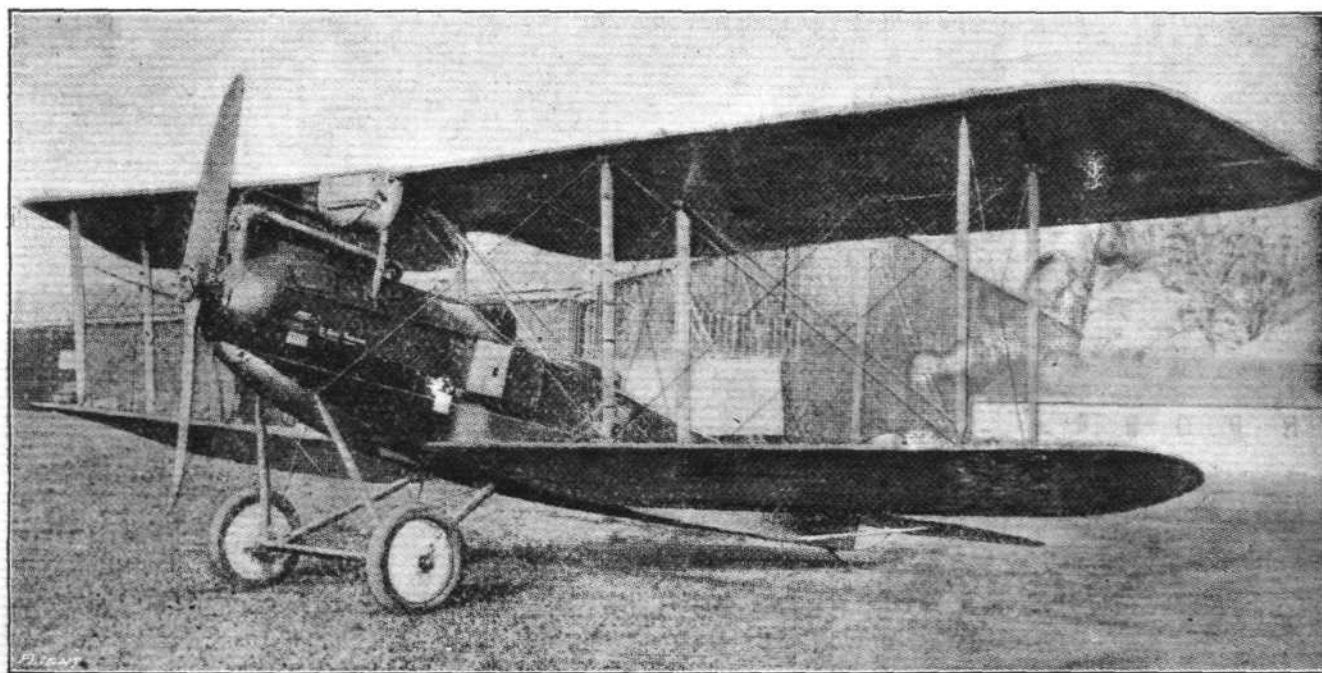


THE C. IV-TYPE RUMPLER BIPLANE.—Three-quarter front view of the 206 h.p. Mercedes model.

speed, which is equal to that of a chaser single seater, and also on account of its high "ceiling" (6,500 metres). This capacity for flying at great altitudes has led the German aviation services to employ a special respirator adopted recently. The

Their angle of incidence is uniform and is equal to 5 degrees.

In plan the upper wings are of trapezoidal form, with rounded angles. Above the *fuselage*, the trailing edge is cut out as shown in the illustrations.

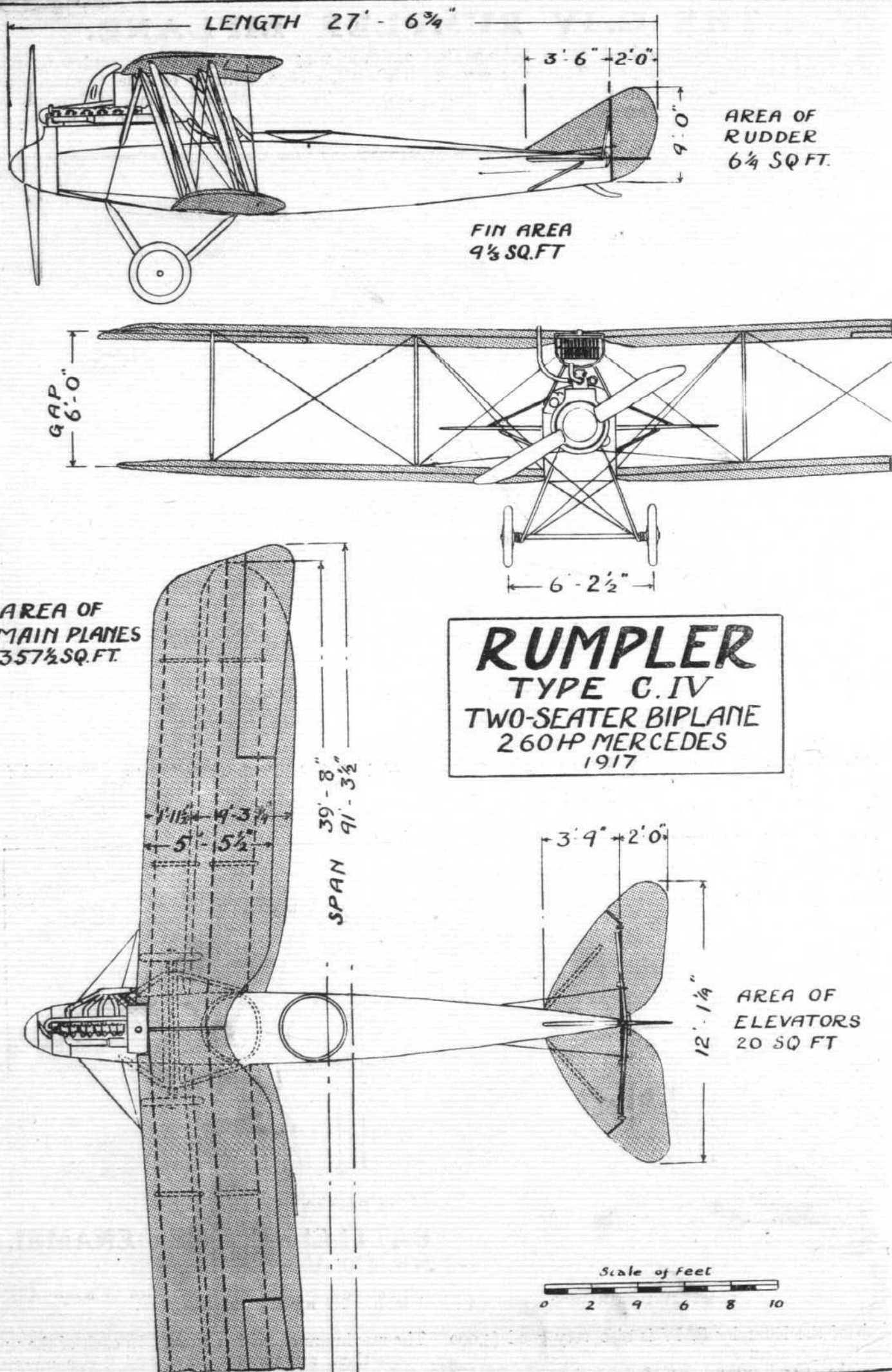


The C. IV-type Rumpler biplane fitted with a 250 h.p. Maybach engine.

climb of the Rumpler C. IV is also very good (5,000 metres in 35 minutes).

Wings.—Both upper and lower wings are swept back 3 degrees. There is a dihedral angle of 2 degrees

The maximum chord is 1.70 m. In each of the upper wings there are 19 main ribs, and five compression struts of steel tubes. The *ailerons* are of the tapering type, their chord varying from 0.50 to 0.65 m. The



THE C.IV-TYPE RUMPLER BIPLANE.—Plan, side and front elevations to scale.

lower wings, as in so many other German machines, have rounded wing tips. As the radius of the arc forming the rear edge is longer than that of the front, the wing tip resembles somewhat that of a propeller blade. Each of the lower wings has 17 main ribs, and four steel tube compression struts.

The interplane struts, of which there are two on each side of the *fuselage*, are oblique. In section, the inner front struts measure 0.105 m., and the rear strut 0.130 m., while the outer front strut measures 0.090 m. and the rear outer strut 0.085 m. The gap between the wings is 1.85 m., and the total lifting surface is 33.5 square metres, of which the upper wing is 20 square metres and the lower wing 13.5.

Tail.—The tail plane, which is not adjustable, is not so deep as in previous types. In plan, the leading edge of the tail plane is approximately a semi-circle. This tail plane is supported on each side by struts attached at their other end to the bottom rail of the *fuselage*. Two other struts brace the tail plane to the vertical fin. The struts under the tail

allow the induction pipes to pass between the legs of the *cabane*. With the Maybach, which offers less encumbrance, this arrangement is not necessary. The motor is supplied with fuel from two tanks. The main one (about 220 litres) is placed under the seat of the pilot, the second, the service tank (about 70 litres), is placed at the back of the pilot between him and the gun ring in the gunner's cockpit. The quantity of fuel carried allows of a flight of four hours' duration. The covering over the engine leaves the top of the cylinders exposed, and encloses a Spandau machine gun operated by the motor.

The exhaust pipes run from the six cylinders to a common chimney, curving upwards and backwards. The chimney itself is divided, about half way up, into three branches, probably in order to obtain a certain amount of silencing effect. As in previous models, the radiator, which is semi-circular in shape, is placed on the front legs of the *cabane*. In front of it is a series of small slats, which can be moved so as to be either parallel to or at right angles to the direction



Another view of the
260 h.p. C. IV - type
Rumpler biplane.

plane are provided with a series of sharp-edged metal points. It appears probable that the object of these is to prevent the landing crew, when wheeling the machine about, from catching hold of these struts, thus possibly bending them. The elevator is in two parts, each of which is partly balanced by a triangular forward projection. The rudder, which is built up of metal tubes, is of the usual type, and the control cables pass inside the *fuselage*, guided at points through small wooden tubes.

The Fuselage.—The construction of the *fuselage* is of the current type, with four *longerons* and struts and cross members, braced by piano wire. Front and rear are covered with three-ply wood, and the middle with fabric. The propeller (a Heine) has a diameter of 3.17 m. As on all other German machines, the propeller boss is enclosed in a "spinner."

Engine.—The motor fitted on the Rumpler is either a 260 h.p. Mercédès or a 250 h.p. Maybach, both having six vertical cylinders. When the Mercédès is fitted, it is slightly tilted to the right, in order to

allow the induction pipes to pass between the legs of the *cabane*. This is, of course, done in order to make it possible for the pilot to adjust the cooling according to the altitude at which he is flying.

Behind the motor is the pilot's cockpit, and behind him again that of the gunner. Supported on a gun ring in the rear cockpit is a Parabellum machine gun. Pilot and gunner are very close together. In the gunner's cockpit there is a bomb rack of the usual type, carrying four bombs. An opening in the floor permits of taking photographs, and the machine carries a wireless set. The landing chassis is of the V type, with rubber shock absorbers. There is no brake fitted on this machine. An external drift cable runs from the nose of the *fuselage* to the foot of the inner front interplane strut.

A Mid-Air Surrender.

A "KAMERAD" story to hand *via* Amsterdam tells of the occupants of a German aeroplane surrendering in mid-air. According to this report a number of Allied machines surrounded the Germans, who, seeing the hopelessness of resisting, went southwards, "obediently flying in the midst" of the Allied squadron.

HONOURS.

Honours for the R.F.C.

It was announced in a supplement to the *London Gazette* on February 18th that the King has been pleased to confer the following rewards for gallantry and distinguished service in the Field. The acts of gallantry for which the decorations have been awarded will be announced as early as practicable —

Bar to the D.S.O.

2nd Lieut. (Temp. Capt.) J. T. B. McCudder, D.S.O., M.C., Gen. List and R.F.C. (D.S.O. gazetted February 4th.)

Distinguished Service Order.

Temp. Capt. W. G. Barker, M.C., Gen. List and R.F.C.
Major A. B. Carter, Can. Inf. and R.F.C.

Bar to Military Cross.

Temp. Capt. (Acting Major) H. O. Holmes, M.C., R.F.C. (M.C. gazetted January 1st.)

2nd Lieut. (Temp. Capt.) C. A. Stevens, M.C., W. Riding R., and R.F.C. (M.C. gazetted October 27th, 1917.)

The Military Cross.

Lieut. F. A. Bates, Yeo. and R.F.C.

Temp. Lieut. (Temp. Capt.) J. C. B. Firth, Gen. List and R.F.C.

2nd Lieut. A. C. B. Harrison, Ox. and Bucks. L.I. and R.F.C.

Temp. 2nd Lieut. (Temp. Capt.) N. MacMillan, Gen. List and R.F.C.

Lieut. (Temp. Capt.) J. Mitchell, R.F.C. (S.R.).

Temp. 2nd Lieut. K. B. Montgomery, Gen. List and R.F.C.
Capt. L. G. S. Payne, Suff. R. and R.F.C.

Temp. 2nd Lieut. F. G. Quigley, Gen. List and R.F.C.

2nd Lieut. (Temp. Capt.) H. A. Smith, Middx. and R.F.C.

Lieut. (Temp. Capt.) G. J. Willcox, High. L.I. and R.F.C.

Lieut. L. W. Sutherland, Aus. F.C.

Amendments.

The following are the correct descriptions of officers upon whom rewards have recently been conferred :—

Temp. 2nd Lieut. A. R. H. Noss, M.C., Gen. List and F.C. (M.C. gazetted January 8th, 1918.)

Capt. and Flight Commander S. I. Winter-Irving, M.C., Aus. F.C. (M.C. gazetted January 18th, 1918.)



IN THE HANDS OF THE ENEMY.

THE following is an official list, published in Germany, of British machines which the Germans claim fell into their hands during the month of November, 1917 :—

28 Sopwiths.

Single-Seaters.

No. B. 2408, Lieut. Harrison, prisoner.

No. B. 5160, Lieut. Taylen, prisoner.

No. B. 6355, Lieut. Cribb, prisoner.

No. 6382, Lieut. P. Wilmot, prisoner.

No. B. 2441, Lieut. Gordon, prisoner.

No. B. 630, Lieut. Felix Cobbold, wounded.

No. B. 1757, Lieut. Thompson, prisoner.

No. B. 6290, Lieut. W. S. Magreth, prisoner.

No. D. 2040, Lieut. K. S. Morrison, wounded.

No. B. 2458, 2nd Lieut. Ted Prior Morgan, prisoner.

No. 3375, Occupant dead.

Motor No. 1344/11493, Lieut. Hall, dead.

No. unknown, 2nd Lieut. Harold Partridge Ledger, dead.

No. B. 6267, Occupant wounded.

No. B. 6269, Occupant wounded.

No. B. 5222, Lieut. C. F. Keller, prisoner.

In the case of five Sopwith single-seaters the numbers of machines and names of occupants could not be ascertained.

Two-Seaters.

No. unknown, 2nd Lieut. Atkinson, prisoner.

In one Sopwith two-seater the number of the machine and the names of the occupants could not be ascertained.

Camels.

No. B. 3824, 2nd Lieut. M. W. Breacliffe, prisoner.

No. F.I.B. 6385, 2nd Lieut. C. J. Kent, prisoner.

No. B. 2366, 2nd Lieut. Eugen F. Marchand, prisoner.

No. B. 2417, Lieut. David Harden Scott, dead.

In the case of one Sopwith Camel the number of the machine and the name of the occupant could not be ascertained.

7 de Havillands.

Single-Seaters.

No. A. 9201, 2nd Lieut. O. W. Meredith, dead.

In the case of 4 de Havilland single-seaters the numbers of machines and names of occupants could not be ascertained.

Two-Seaters.

No. unknown, 2nd Lieut. W. C. Prudon, Sergt. John Coulin, both prisoners.

No. A. 2170, 2nd Lieut. R. Main, wounded, J. Mach Leach, prisoner.

4 B.E. Two-Seaters.

No. A. 7292, Lieut. F. W. Morse, wounded; Sergt. Stephanson, dead.

No. unknown, M. Samways, Lieut. P. C. Campbell, both dead.

In the case of two B.E. two-seaters the numbers of machines and the names of the occupants could not be ascertained.

4 S.E. Single-Seaters.

No. unknown, Lieut. Kingsland, wounded.

In the case of three S.E. single-seaters the numbers of machines and names of occupants could not be ascertained.

4 Spad Single-Seaters.

No. 6777, Lieut. Cockburn, dead.

In the case of three Spad single-seaters the numbers of the machines and the names of the occupants could not be ascertained.

3 Nieuport Single-Seaters.

No. C. 6827, 2nd Lieut. F. G. Baker, prisoner.

No. 3578, Lieut. L. Kert, prisoner.

No. B. 67290, 2nd Lieut. S. Steward Henry, prisoner.

2 R.E. Single-Seaters.

No. unknown, Lieut. W. G. Mann, dead.

In the case of one R.E. single-seater the number of machine and the name of the occupant could not be ascertained.

2 Bristol Fighters. Two-Seaters.

No. unknown, Lieut. Megget, prisoner; Capt. Durrad, dead.

No. 3215, Lieut. H. C. Robinson, prisoner; Lieut. J. J. B. Hammersley, wounded.

2 Martinsyde Two-Seaters.

The numbers of the machines and the names of the occupants could not be ascertained.

1 F.E. Two-Seater.

No. A. 5577, Capt. E. B. Barnes, both occupants dead.

1 Handley-Page Two-Seater.

No. 3141, Lieut. Linnell, Lieut. Smith.

3 English Single-Seaters.

The numbers of the machines and the names of the occupants could not be ascertained.



"Mentioned in Despatches."

In a supplement to the *London Gazette*, dated February 12th, it was announced that the following officers have been brought to the notice of the Secretary of State for War by the Army Council, for very valuable services rendered in connection with the war up to December 31st, 1917 :—

Major and Bt. Lt.-Col. (Temp. Brig.-Gen.) D. LE G. PITCHER, Ind. Army.

Capt. (Temp. Lt.-Col.) C. H. WHITTINGTON, R.F.C. (Spec. Res.).

Antarctic Medal for R.N.A.S. Officer.

AMONG the awards announced on Feb. 16th of the Polar Medal with clasp inscribed "Antarctic, 1914-16," was that

of Prob. Flight Officer L. A. Hooke, R.N., who was with the "Aurora" Party, and receives the Silver Medal.

Medals for Gallant Rescue Work.

INCLUDED in the awards made at the last monthly committee meeting of the Royal Humane Society were the following medals :—

To 2nd Lieut. J. S. HODGES, Royal Fusiliers, attached R.F.C., for his gallant attempt to save Lieut. Fedden, whose aeroplane came down in the sea 800 yards from shore on Jan. 7th (Lieut. Hodges flew out and dropped into the sea, where he supported Lieut. Fedden for 35 minutes, when a boat reached them, though by that time Lieut. Fedden was dead).

To Capt. S. HOOPER, R.F.C., for the rescue of Sergt. Powell from the sea off Folkestone on Feb. 26th, 1917.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

ANNUAL GENERAL MEETING.

THE Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held on Wednesday, March 27th, 1918, at 3, Clifford Street, New Bond Street, London, W.1, at 6 o'clock.

Notices of motion for the Annual General Meeting must be received by the Secretary not less than 21 days before the meeting, and must be signed by at least five members. The last day for the receipt of notices of motion is Wednesday, March 6th, 1918.

Committee.

In accordance with the rules, the Committee shall consist of 18 members. Members are elected to serve for two years, half the Committee retiring annually. Retiring members are eligible for re-election.

The retiring members of the Committee are:—

Brig.-Gen. The Duke of Atholl, M.V.O., D.S.O.
Lieut.-Col. W. D. Beatty, R.E.
Brig.-Gen. W. S. Brancker, R.F.A.
G. B. Cockburn.
Lieut.-Col. F. Lindsay Lloyd.
Major J. T. C. Moore-Brabazon, R.F.C.
Commander C. R. Samson, R.N., D.S.O.
A. Mortimer Singer.
T. O. M. Sopwith.

Any two members of the Club can nominate a member to serve on the Committee, provided the consent of the member has been previously obtained. The name of the member thus nominated, with the names of his proposer and seconder, must be sent in writing to the Secretary not less than 14 days before the Annual General Meeting. The last day for the receipt of nominations is Wednesday, March 13th, 1918.

SPECIAL COMMITTEE MEETING.

A Special Meeting of the Committee was held on Wednesday, the 13th inst., when there were present:—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the chair, Wing-Comdr. John D. Dunville, R.N., Wing Comdr. F. K. McClean, R.N., Mr. J. H. Nicholson and Mr. A. Mortimer Singer. In attendance Lieut.-Com. H. E. Perrin, R.N.V.R.

Election of Members.—The following new members were elected:—

Frederick William Berwick.
Capt. Sir Michael W. S. Bruce, Bart., R.F.A.
2nd Lieut. Edgar Watchorn Christie.
Jacques Jules Daniel Fauquet.
Capt. Thomas Henderson, R.E.
Flight Comdr. Thomas Vaughan Lister, R.N.
Major William McClure (South Lancashire Regt.).
Eng. Lieut.-Comdr. Reginald Gascoigne Law Markham, R.N.
Charles Harrington Moore.
Rene Pottier.
Capt. Elvy Robb, R.F.C.
Capt. Robin Rowell, R.F.C.
Squadron Comdr. Frederick Esk Sandford, R.N.
2nd Lieut. Alexander Hugh Welsh, R.F.C.
Lieut. Godfrey Wentworth Wentworth, Norfolk Regt. and R.F.C.

THE FLYING SERVICES FUND, administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 3, Clifford Street, New Bond Street, London, W. 1.

Subscriptions.	£	s.	d.
Total subscriptions received to Feb. 12th, 1918	12,603	15	6
Staff and Workers of Gwynnes, Ltd. (fifty-sixth contribution)	10	14	1

Total, February 19th, 1918 12,614 9 7

H. E. PERRIN, Secretary.
3, Clifford Street, New Bond Street, W. 1.

"X" AIRCRAFT RAIDS.

"X 89" Raid (February 16th-17th).

The following *communiqués* have been issued by the Field-Marshal Commanding-in-Chief, Home Forces:—

February 16th, midnight.

"Hostile aircraft crossed the Kent coast of the Thames Estuary shortly before 10 this evening, and proceeded towards London. The raid is still in progress. So far only one bomb is reported as having been dropped in London."

February 17th, 10.45 a.m.

"About half-a-dozen enemy aeroplanes made the mouth of the Thames about 9.45 last night and carried out an attack against London. All were turned back save one machine, which penetrated into the capital along the line of the river and dropped a single bomb in the South-West district about 10 p.m. This bomb demolished a house and buried an invalided officer, his wife, and two children. Several other bombs were dropped by the raider in the eastern outskirts on its way in, but no serious casualties or damage are reported. An attack which was delivered against Dover about 10.45 p.m. was driven off, some bombs being dropped in open country. Several of our pilots engaged the enemy. One of them fought an action over the Kent coast, and shortly afterwards a large enemy machine was seen from the shore to crash into the sea. Police reports of casualties and damage have not yet been received, but are apparently light."

"February 18th.

"The total casualties caused by the aeroplane raid on Saturday night were:—Killed: 3 men, 5 women, 3 children; total, 11. Injured: 1 man, 3 children; total, 4."

"X 90" Raid (February 17th-18th).

February 17th, 11.40 p.m.

"Hostile aeroplanes came in over the Thames Estuary

shortly after 10 p.m. and proceeded towards London. Some bombs have been dropped in the capital. The raid is still in progress."

"February 18th.

"Last night's air raid appears to have been carried out by six or seven enemy aeroplanes, of which only one penetrated into London. The first raider passed the Isle of Thanet about 9.45 p.m., and proceeded up the Thames Estuary into London, crossing the capital from south-east to north-west. Bombs were dropped in various districts between 10.40 and 10.55 p.m. The remaining raiders, which attempted to reach London from the north-east across Essex, or from the east along the line of the River Thames, were all turned back. The casualties caused by last night's aeroplane raid were:—Killed: 13 men, 3 women; total, 16. Injured: 27 men, 10 women; total, 37."

"X 91" Raid (February 18th-19th).

"February 18th, midnight.

"Hostile aircraft crossed the coast of Essex shortly after 9 o'clock to-night and proceeded towards London. None of the raiders penetrated the defences, and so far no damage or casualties have been reported."

"February 19th.

"No casualties or damage were caused in last night's air raid."

Air Raid Warning in Paris.

THE following official *communiqué* was issued in Paris on February 18th:—

"At 9.40 p.m. suspicious sounds of motors were heard by our guard posts in the north-east region. A warning was given and precautionary measures were immediately taken. At 10.30 p.m. the sounds of the motors had ceased. No bombs are reported to have been dropped. At 11 p.m. the warning was over."

THE ROLL OF HONOUR.

Reported by the Admiralty:—

Accidentally Killed.

Flight Sub-Lieut. C. Jewell, R.N.

Previously reported Wounded, now reported Died of Wounds.

Flight Sub-Lieut. A. J. Binks, R.N.

Previously reported Missing, now Officially presumed Drowned,

Flight Sub-Lieut. T. S. S. Hood, R.N.

Accidentally Injured.

Prob. Flight Officer H. J. Bradley, R.N.
Prob. Flight Officer W. G. Illingworth, R.N.
Flight Sub-Lieut. J. A. Radcliffe, R.N.
Prob. Flight Officer R. B. Wilby, R.N.

Missing.

Flight Sub-Lieut. Wt. H. Day, R.N.

Previously Missing, now reported Prisoner.

Flight Lieut. C. G. Bronson, R.N.
Flight Sub-Lieut. J. H. T. Carr, R.N.

Reported by the War Office:—

Killed.

2nd Lieut. H. E. Barwell, R.F.C.
2nd Lieut. A. M. Beamer, R.F.C.
Lieut. J. H. Caldwell, Camn. Highrs., attd. R.F.C.
2nd Lieut. A. H. Giovanetti, R.F.C.
2nd Lieut. H. Kearley, Lond. R., attd. R.F.C.
2nd Lieut. F. A. Lewis, R.F.C.
31142 1st Air Mech. W. Richards, R.F.C.

Previously Missing, now reported Killed.

Lieut. H. C. R. Ainger, Scots, attd. R.F.C.
2nd Lieut. W. R. Bishop, R.F.C.
Capt. C. M. Clement, R.F.C.
Lieut. N. Field, Manch. R., attd. R.F.C.
Lieut. R. L. Graham, R.F.C.
2nd Lieut. G. W. Hall, R.F.C.
2nd Lieut. E. J. Halliwell, R.F.A., attd. R.F.C.
2nd Lieut. E. T. H. Hearn, R.F.A., attd. R.F.C.
2nd Lieut. R. G. Jardine, R.F.C.
2nd Lieut. W. R. Keast, R.F.C.
2nd Lieut. F. J. McCullough, R.G.A., attd. R.F.C.
Lieut. J. M. McKenna, R.F.C.
Lieut. B. S. Marshall, M.C., R.F.C.
2nd Lieut. S. C. Sillem, R.F.C.
2nd Lieut. S. Sutcliffe, R. Welsh Fus., attd. R.F.C.
2nd Lieut. J. G. Warter, Wilts. R., attd. R.F.C.

Died of Wounds.

2nd Lieut. F. D. Miller, R.F.C.

Accidentally Killed.

Lieut. D. Q. Ellis, Can. Rly. Troops, attd. R.F.C.
54863 2nd Air Mech. J. Solomon, R.F.C.
4000 1st Air Mech. A. W. Wirths, R.F.C.

Died.

Lieut. C. H. Perry, R. Fus., attd. R.F.C.
49852 2nd Air Mech. R. W. Blacklock, R.F.C.
61115 3rd Air Mech. P. G. Carter, R.F.C.
37262 2nd Air Mech. H. J. Curtis, R.F.C.
8183 Corp. G. H. Furneaux, R.F.C.
30877 Corp. R. J. Harper, R.F.C.

Drowned.

The following are mechanics in the R.F.C., unless otherwise stated, the figure in brackets indicating the grade:—
7281 Corp. W. Achurch; 33702 Air Mech. F. Attenborough;
60563 Air Mech. E. Brooks; 49279 Air Mech. T. H. Clarke;
92905 Air Mech. F. Dale; 63665 (2nd) Air Mech. H. Dobson;
82859 Air Mech. R. F. Dudman; 98166 Air Mech. S. Gough;
92907 Air Mech. W. W. Greaves; 92705 Air Mech. E. W. Jackson;
48764 (2nd) Air Mech. J. Laurens; 35213 (3rd) Air Mech. C. Lee;
51842 (2nd) Air Mech. H. Lucas; 67660 (2nd) Air Mech. J. Crimmon;
93463 (3rd) Air Mech. E. McGuinness; 91432 Air Mech. G. L. Martin;
83823 Air Mech. S. Pilkington;
85233 Air Mech. T. Rees; 92283 Air Mech. W. E. Ridgwell;
92711 Air Mech. T. Sidebottom;
91451 Air Mech. R. B. Toms; 105028 Air Mech. F. J. Waller;
92913 Air Mech. H. C. Wiley; 91382 Air Mech. R. J. Williams.

Wounded.

2nd Lieut. P. Barker, R.F.C.
2nd Lieut. H. K. Boysen, R.F.C.
Lieut. G. Harwood, Suff. R., attd. R.F.C.
Lieut. W. H. Kelley, S. Lan. R., attd. R.F.C.
2nd Lieut. G. A. Lipsett, R.F.C.

Capt. J. H. Medcalf, R.F.C.
2nd Lieut. C. B. Millett, R.F.C.
2nd Lieut. G. Russell, R.F.C.
Lieut. D. Shanks, R.F.C.
2nd Lieut. J. O. M. Turnbull, R.F.C.
94425 2nd Air Mech. S. L. Leyland, R.F.C.
405239 W. H. Mann, R.F.C.

Previously reported Wounded, now reported Not Wounded.

2nd Lieut. T. R. Whitehead, R.F.C.

Missing.

2nd Lieut. A. G. D. Alderson, Worc. R., attd. R.F.C.
2nd Lieut. A. C. Ball, Sher. For., attd. R.F.C.
2nd Lieut. E. O. Cudmore, R.F.C.
Lieut. R. S. Gaisford, R.F.A., attd. R.F.C.
Lieut. E. G. Green, M.C., R.E., attd. R.F.C.
2nd Lieut. A. Holmes, R.F.C.
2nd Lieut. P. F. Kent, R.F.C.
2nd Lieut. P. A. B. Lytton, R. Ir. Regt., attd. R.F.C.
2nd Lieut. P. C. C. Martin, Sher. For., attd. R.F.C.
Lieut. L. W. B. Moore, R.F.A., attd. R.F.C.
Lieut. L. H. Pakenham-Walsh, Ches. R., attd. R.F.C.
2nd Lieut. R. P. Pohlmann, R.F.C.
Major F. J. Powell, M.C., R.F.C.

Missing (believed Drowned).

104189 (2nd) Air Mech. J. Armstrong; 67796 (3rd) Air Mech. B. Bird; 94421 (2nd) Air Mech. B. Bradley; 92780 (3rd) Air Mech. R. Brown; 75931 (2nd) Air Mech. L. Butterworth; 92700 (3rd) Air Mech. W. Cartwright; 93460 (3rd) Air Mech. G. W. Daffern; 92781 (3rd) Air Mech. C. Deller; 92241 (2nd) Air Mech. J. C. Driver; 58337 (3rd) Air Mech. W. Dunton; 90142 (2nd) Air Mech. J. A. Hunt; 85071 (2nd) Air Mech. J. Humphreys; 93221 (3rd) Air Mech. T. H. Jackson; 94023 (2nd) Air Mech. F. Kendall; 10398 (1st) Air Mech. W. Knight; 92855 (3rd) Air Mech. J. Lane; 40997 (2nd) Air Mech. E. T. Morris; 27617 Corp. F. J. Richardson; 93464 (3rd) Air Mech. C. Ricketts; 405720 (2nd) Air Mech. J. Rae; 91813 (3rd) Air Mech. F. J. Turner; 81830 (2nd) Air Mech. J. W. Witchlow; 93057 (3rd) Air Mech. B. H. Wolfe; 93334 (3rd) Air Mech. R. W. Wyse.

Previously reported Prisoners, now reported Wounded and Prisoners in German hands.

2nd Lieut. C. H. Brown, R.F.C.
2nd Lieut. F. J. B. Hammersley, Middx. R., attd. R.F.C.
2nd Lieut. W. R. Kingsland, R.F.C.
2nd Lieut. D. Miller, R.F.C.
2nd Lieut. R. J. G. Stewart, R.F.C.
7700 1st Air Mech. W. S. Crust, R.F.C.

Previously Missing, now reported Prisoners in German hands.

2nd Lieut. H. V. Biddington, R.F.C.
Lieut. J. Boyd, Sco. Rif., attd. R.F.C.
2nd Lieut. A. F. Castle, R.F.C.
2nd Lieut. A. L. Clark, R.F.C.
2nd Lieut. H. E. Davies, R.F.C.
2nd Lieut. C. W. Leggatt, R.F.C.
Capt. E. E. F. Pope, R.F.C.
2nd Lieut. G. F. Turner, R.F.C.
2nd Lieut. J. H. Young, Lond. R., attd. R.F.C.

Previously Missing, now reported Prisoners in Austrian hands.

Lieut. J. D. Barnes, Durh. L.I., attd. R.F.C.
Lieut. G. N. Goldie, R.F.C.

Previously Missing, now reported Prisoners in Bulgarian hands.

Lieut. A. Rowan, K.R.R.C., attd. R.F.C.
2nd Lieut. H. A. Tracey, S. Wales Bord., attd. R.F.C.

Interned in Holland.

Lieut. W. Biheller, M.C., R.F.C.

Correction: Killed.

M2/033247 Corpl. W. C. Perry, A.S.C., attd. R.F.C., should read 2nd Lieut. W. C. Perry, R.F.C.

From Germany to Holland.

INCLUDED in the party of officer-prisoners who arrived in Rotterdam from Germany on February 17th were:—

2nd Lieut. J. G. H. Frew, R.F.C.
2nd Lieut. A. L. Sutcliffe, S. Staffs. attd. R.F.C.

American General's Son Killed.

A SON of Major-Gen. Peyton C. March, the new Acting Chief of the United States Army Staff, has been killed in an aeroplane accident at an American training camp.

ON MOMENTS OF INERTIA.

By T. H. JONES, B.Sc., A.M.I.M.E.

AN accurate knowledge of the methods of finding the moment of inertia is of very great importance to the designer and stress-draughtsman in almost any branch of engineering, and this is particularly so in a few of the more modern branches where maximum strength must be consistent with minimum weight. In many of the easier and regular shapes of sections the moment of inertia (I) can be readily found by calculation which ensures a good degree of accuracy; but quite a large number of shapes of sections in common use are such that for accuracy the methods of calculation would not be practicable. For these difficult sections I is usually found graphically, and almost any text book will provide some method of doing the work; but the methods generally suggested, however, are often difficult to use and liable to inaccuracy. The following method is about the best, and it can be recommended for its simplicity and general reliability. To find the I of any section, draw out the section, then cube all the ordinates with the neutral axis as base. Complete the figure formed by these ordinates, and find the area enclosed by the curve so drawn. One third of this area = I of this section.

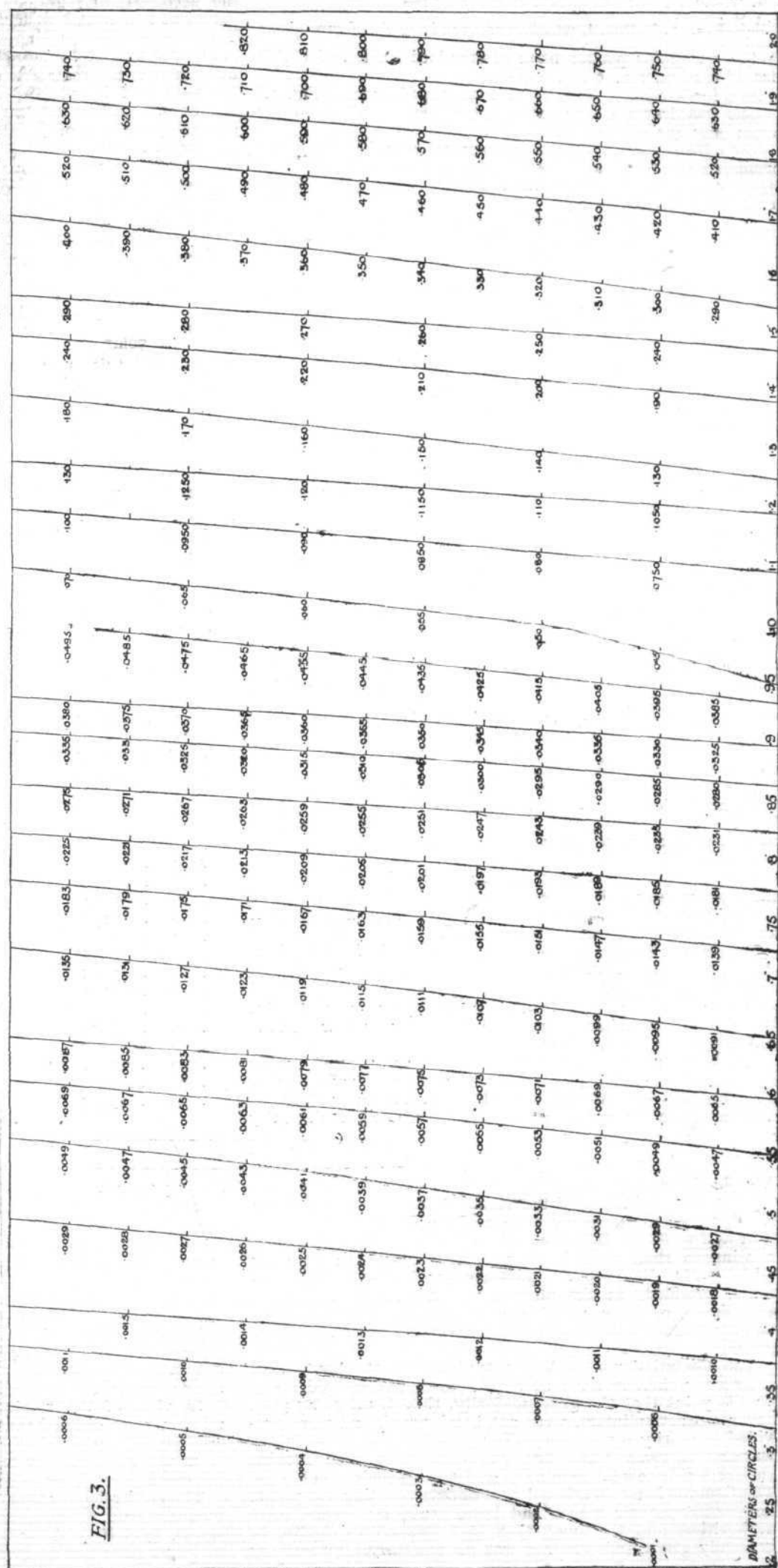
Very often the section has to be drawn to some scale, and this must be accounted for in the estimate of I .

As an example, take a 5-in. \times 3-in. I beam section the linear dimensions of which were drawn full size. (Fig. 1.) Since the section is exactly symmetrical only a quarter need be drawn. By means of a table of cubes found in most pocket books the lengths of the ordinates from the neutral axis are cubed, and for convenience are set out one-third size, the cube figure being distinguished by the open shading. To find the I of the whole section of the beam. We find the area of this cube figure by means of a planimeter to be 3.4 sq. ins. Now the

AREA OF
CUBE
FIGURE.

FIG. 1.

X X
I BEAM SECTION.



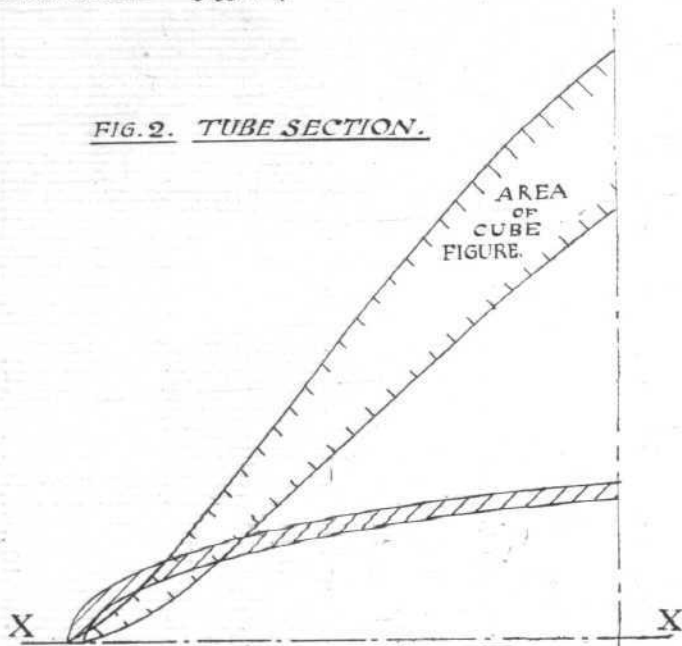
cube scale is one-third (Linear Scale :—full size), therefore I of whole section about XX is given by :—

$\frac{3 \cdot 4 \times 4}{3} = 13.61 \text{ (ins.)}^4$, which corresponds to the figure given in the particular pocket book of standard sections for this size of section, i.e., 5 ins. \times 3 ins.

As a further example, take an oval-shaped tube. (Fig. 2.) This was drawn 4 \times actual size, but because of symmetry again only one quarter was drawn.

The cube figure was drawn in the usual way, i.e., the actual ordinates are cubed and then drawn to scale 100 times full size for convenience. The area of the cube figure for the whole section = 5.59×4 .

FIG. 2. TUBE SECTION.



Now linear scale = 4. Cubes scale = 100.
 \therefore I of whole section about axis XX

$$= \frac{5.59 \times 4}{3 \times 100 \times 4} = .01863 \text{ (in.)}^4.$$

If the section be not symmetrical then the C.G. must be found, through which the neutral axis is then drawn and the cube figure constructed in two separate portions, the one above the axis and the other below it.

This method can be used for any shape of section, to find the I about any axis of bending; it is quick and accurate, simple and straightforward, and is certainly not so well known as its usefulness would warrant.

For circular sections of rods, tubes, &c., the I of the sections is easily calculated from the ordinary rule :— $I = \frac{\pi}{64} (D^4 - d^4)$,

where D = outer, and d = inner, diameters respectively. Many pocket books give a list of values of I for circular sections which is undoubtedly of much use.

The usefulness of such a table is, however, considerably lessened when the gauge of a tube, say, is such that the inner diameter becomes an odd size, although the outer diameter may be quite an even figure. To overcome this difficulty

and to save time in getting out the values of I for such sections, the accompanying graph (Fig. 3) has been made, showing values of I of circles of diameter .2 in. up to diameter 2.0 ins. They are plotted in such a way that a good degree of accuracy may be obtained by mere inspection of the graph. It will be seen that the scale of I is not constant, and consequently the values of I are written on the curves themselves, but the curves themselves are all successively continuous. As an example of one of the many uses of such a graph, take the case of a metal tube having an outside diameter of .875 in., and gauge thickness = 20 = .036 in.

Therefore inside diameter = .803 in.

From the graph the I corresponding to a diameter .875 in. = .02876, and I corresponding to diameter .803 in. = .02038.

Hence nett I of tube = .02876 - .02038 = .00838 being the difference.

Conversely knowing the value of I for a tube, which will suit the particular job in hand, then the diameter and gauge can easily and quickly be found by reference to the graph.

If the polar moment of inertia of any circular section be required, this is equal to twice the I about a diameter.

The usefulness of such a graph like the one illustrated in Fig. 3 is considerable, but for those who would prefer to interpolate, the tabulated values of I are here given, together with the corresponding diameters.

This system of graphing has wide application where accurate readings are required by mere inspection and it is for the readers themselves to apply the method to their own particular needs.

Diam. of Circle. Ins.	Values of I.	Diam. of Circle. Ins.	Values of I.	Diam. of Circle. Ins.	Values of I.
.150	.0000248	.600	.006362	1.30	.14019
.200	.0000785	.610	.006796	1.32	.14902
.225	.0001258	.625	.007489	1.35	.16304
.250	.0001918	.635	.007981	1.37	.17291
.275	.0002807	.650	.008754	1.40	.18890
.300	.0003976	.675	.010190	1.42	.19959
.310	.0004533	.700	.011790	1.45	.21698
.325	.0005475	.725	.013550	1.48	.23550
.335	.0006182	.750	.015570	1.50	.24849
.350	.0007365	.775	.017700	1.52	.26200
.365	.0008711	.800	.020100	1.55	.28332
.375	.0009701	.825	.022740	1.57	.29824
.385	.001079	.850	.025610	1.600	.32169
.400	.001256	.875	.028760	1.625	.34310
.410	.001387	.900	.032180	1.650	.36382
.425	.001601	.925	.035910	1.670	.38181
.430	.001678	.950	.039960	1.700	.40998
.450	.002013	.975	.044340	1.720	.42962
.460	.002198	1.000	.049090	1.750	.46040
.475	.002498	1.025	.054160	1.780	.49277
.480	.002606	1.040	.057420	1.800	.51523
.500	.003068	1.075	.065580	1.820	.53857
.510	.003321	1.100	.071780	1.850	.57496
.525	.003729	1.130	.080040	1.875	.60670
.530	.003874	1.160	.088880	1.900	.63967
.550	.004487	1.200	.101780	1.920	.66697
.560	.004828	1.230	.112360	1.950	.70988
.575	.005358	1.250	.119830	1.970	.73929
.580	.005555	1.270	.127690	2.000	.78540
				2.020	.81726

Air Raid Precautions.

On the invitation of the Home Secretary, a conference of representatives of the local authorities of London was held at the Home Office on Feb. 13th to consider questions relating to shelters and other matters connected with air raids. Mr. Brace, the Parliamentary Under-Secretary of State, presided, in the absence of the Home Secretary, and the Lord Mayor and representatives of the London County Council and most of the metropolitan boroughs were present.

The Commissioner of Police explained that about 1,650 emergency shelters have been scheduled, but he laid stress on the point that the great majority, though affording good cover against splinters, were not bomb-proof, and were provided primarily for persons who are in the streets when the warning is given. The first consideration was to provide shelter for those who were not able to reach their own homes. The Commissioner mentioned that notices advising the public not to leave their homes had been issued by several local authorities, and the suggestion that this advice might be generally given and followed was unanimously approved by

the representatives present. The general opinion of the conference appeared to be against the continuance of unofficial patrols.

As regards warnings, the representatives of local authorities were unanimously in favour of warning being given by the maroons up to midnight. A few representatives were in favour of the use of sirens to supplement the maroons, but the majority, especially those of the authorities whose areas adjoin the river, where sirens are constantly heard, were against the use of sirens at any time. The conference, with only a few dissentients, resolved against the use of maroons after midnight.

In view of the resolutions of the conference the Commissioner has decided that the maroons (which are at present used up to 11 p.m.) shall be used till midnight, and after that hour the warning will be given by the police whistles and displaying the "Take Cover" notices as heretofore.

The conference unanimously approved of the decision that bugles should be used for the "All Clear" signal, and that sirens, even if used by local authorities to supplement the warning, should in no case be used for "All Clear."

INTERNATIONAL AIRCRAFT STANDARDS.

(Continued from page 184.)

4P1.—Specifications for Turnbuckles.

GENERAL.—1. The general specifications, 1G1, shall form, according to their applicability, a part of these specifications.

MATERIAL.—2. Barrels shall be made of naval brass or equivalent alloy, I.A.S.B. specifications 3N4. The shank shall be made of steel, I.A.S.B. specifications 3S4.

PHYSICAL PROPERTIES AND TESTS.—3. (a) At least 2 per cent. of all turnbuckles shall be subjected to the test load given in the table and must withstand this test.

Steel turnbuckle shanks shall be heat treated to withstand the test loads specified.

(b) A bent test shall be made upon a (unbroken) shank of each turnbuckle tested in tension; the shank must withstand bending through 90 deg. without cracking.

DIMENSIONS AND TOLERANCES.—4. Dimensions and tolerances are given in the tables following.

ASSEMBLY.—5. The threads are to be greased and must

have a snug true fit allowing the barrel or shank to be turned by hand and showing absolutely no slackness in fit or perceptible end shake when the ends have been extended three threads from the barrel.

FINISH.—6. Turnbuckle shanks shall be thoroughly covered with a suitable non-corrosive grease before shipment. Before inspection of the finished turnbuckles they may, if so specified, be copper plated in order that initial stress in the barrel may be detected. After this inspection turnbuckles shall be greased or shall be coated with an air-drying enamel as specified.

3S15.—Specifications for 7 × 19 Extra-Flexible Steel-Wire Cable.

GENERAL.—1. (a) This specification covers the finish, material and construction of high-strength steel wire cable composed of tinned-coated steel wires twisted concentrically around a tinned-steel wire centre, thus forming a strand and

DIMENSIONS IN INCHES.

I.A.S.B. No.	Strength in pounds.	Eye end.										Fork end.								Barrel.			Threads per inch. U.S. standard.
		C	E	X	Y	A	B	J	K	R	W	B	D	F	G	H	P	S	T	L	M	N	
1 A	1,500	0.130	0.203	0.500	0.500	0.219	0.250	0.188	0.219	0.281	0.500	0.275	0.156	0.313	0.110	0.300	0.219	0.500	0.560	0.375	0.281	0.208	30
1 B	1,500	0.130	0.203	1.531	0.500	0.219	0.250	0.188	0.219	0.281	0.500	0.275	0.156	0.313	0.110	0.300	0.219	0.500	0.560	0.375	0.281	0.208	30
1 C	1,500	0.130	0.203	0.500	0.500	0.219	0.250	0.188	0.219	0.281	0.500	0.275	0.156	0.313	0.110	0.300	0.219	0.500	0.560	0.375	0.281	0.208	30
1 D	1,500	0.130	0.203	1.531	0.500	0.219	0.250	0.188	0.219	0.281	0.500	0.275	0.156	0.313	0.110	0.300	0.219	0.500	0.560	0.375	0.281	0.208	30
2 A	2,150	0.157	0.203	0.500	0.563	0.219	0.328	0.188	0.219	0.313	0.500	0.328	0.188	0.313	0.110	0.438	0.219	0.500	0.625	0.375	0.328	0.281	30
2 B	2,150	0.157	0.203	1.531	0.563	0.219	0.328	0.188	0.219	0.313	0.500	0.328	0.188	0.313	0.110	0.500	0.219	0.500	0.687	0.375	0.328	0.281	30
2 C	2,150	0.157	0.203	0.500	0.563	0.219	0.328	0.188	0.219	0.313	0.500	0.328	0.188	0.313	0.110	0.500	0.219	0.500	0.687	0.375	0.328	0.281	30
2 D	2,150	0.157	0.203	1.531	0.563	0.219	0.328	0.188	0.219	0.313	0.500	0.328	0.188	0.313	0.110	0.500	0.219	0.500	0.687	0.375	0.328	0.281	30
3 A	3,000	0.185	0.234	0.500	0.625	0.281	0.391	0.219	0.250	0.375	0.625	0.391	0.250	0.344	0.110	0.625	0.250	0.625	0.813	0.453	0.391	0.313	28
3 B	3,000	0.185	0.234	1.375	0.625	0.281	0.391	0.219	0.250	0.406	0.625	0.391	0.250	0.344	0.110	0.625	0.250	0.625	0.813	0.453	0.391	0.313	28
3 C	3,000	0.185	0.234	0.500	0.625	0.281	0.391	0.219	0.250	0.375	0.625	0.391	0.250	0.344	0.110	0.625	0.250	0.625	0.813	0.453	0.391	0.313	28
3 D	3,000	0.185	0.234	1.375	0.625	0.281	0.391	0.219	0.250	0.406	0.625	0.391	0.250	0.344	0.110	0.625	0.250	0.625	0.813	0.453	0.391	0.313	28
4 A	4,000	0.213	0.265	0.500	0.688	0.344	0.422	0.250	0.281	0.500	0.688	0.422	0.250	0.438	0.203	0.625	0.281	0.688	0.875	0.500	0.438	0.375	26
4 B	4,000	0.213	0.265	1.250	0.688	0.344	0.422	0.250	0.281	0.500	0.688	0.422	0.250	0.438	0.203	0.625	0.281	0.688	0.875	0.500	0.438	0.375	26
4 C	4,000	0.213	0.265	0.500	0.688	0.344	0.422	0.250	0.281	0.500	0.688	0.422	0.250	0.438	0.203	0.625	0.281	0.688	0.875	0.500	0.438	0.375	26
4 D	4,000	0.213	0.265	1.250	0.688	0.344	0.422	0.250	0.281	0.500	0.688	0.422	0.250	0.438	0.203	0.625	0.281	0.688	0.875	0.500	0.438	0.375	26
5 A	5,750	0.256	0.313	0.500	0.750	0.313	0.469	0.281	0.313	0.563	0.750	0.469	0.281	0.563	0.203	0.625	0.313	0.750	0.875	0.531	0.484	0.438	24
5 B	5,750	0.256	0.313	1.250	0.750	0.313	0.469	0.281	0.313	0.563	0.750	0.469	0.281	0.563	0.203	0.625	0.313	0.750	0.875	0.531	0.484	0.438	24
5 C	5,750	0.256	0.313	0.500	0.750	0.313	0.469	0.281	0.313	0.563	0.750	0.469	0.281	0.563	0.203	0.625	0.313	0.750	0.875	0.531	0.484	0.438	24
5 D	5,750	0.256	0.313	1.250	0.750	0.313	0.469	0.281	0.313	0.563	0.750	0.469	0.281	0.563	0.203	0.625	0.313	0.750	0.875	0.531	0.484	0.438	24
6 A	8,400	0.318	0.375	0.500	0.875	0.313	0.500	0.328	0.375	0.625	0.875	0.500	0.313	0.563	0.266	0.563	0.375	0.875	0.875	0.625	0.594	0.469	22
6 B	8,400	0.318	0.375	1.125	0.875	0.313	0.500	0.328	0.375	0.625	0.875	0.500	0.313	0.563	0.266	0.563	0.375	0.875	0.875	0.625	0.594	0.469	22
6 C	8,400	0.318	0.375	0.500	0.875	0.313	0.500	0.328	0.375	0.625	0.875	0.500	0.313	0.563	0.266	0.563	0.375	0.875	0.875	0.625	0.594	0.469	22
6 D	8,400	0.318	0.375	1.125	0.875	0.313	0.500	0.328	0.375	0.625	0.875	0.500	0.313	0.563	0.266	0.563	0.375	0.875	0.875	0.625	0.594	0.469	22

a When a turnbuckle has two eye ends with different size holes for the pin and cable, the two diameters are given.

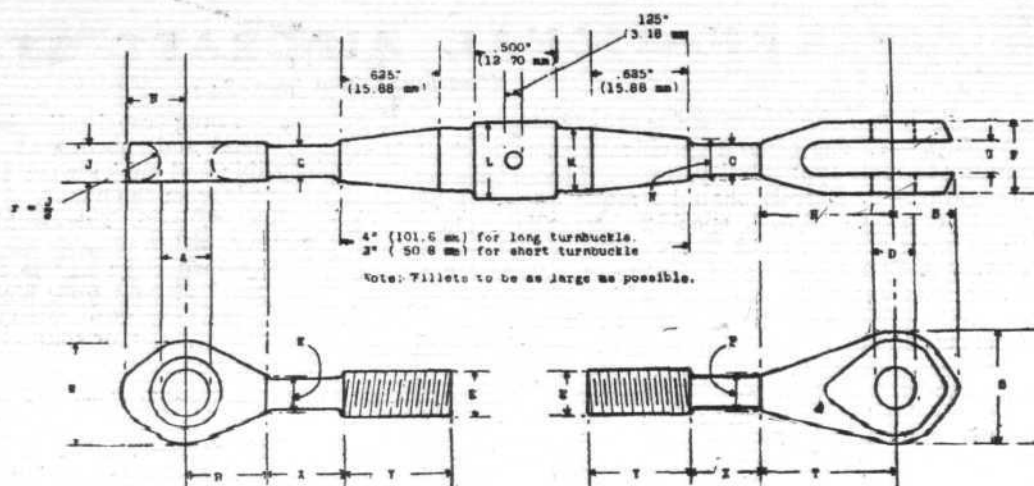
b This turnbuckle is to be bored to receive pin on one end only.

DIMENSIONS IN MILLIMETRES.

I.A.S.B. No.	Strength in kilograms.	Eye end.										Fork end.								Barrel.			Threads per inch. U.S. standard.
		C	E	X	Y	A	B	J	K	R	W	B	D	F	G	H	P	S	T	L	M	N	
		+0.03 - .05		+0.13 - .13	+1.02 - .00	+0.05 - .00	+0.13 - .13	+0.13 - .05	+0.13 - .13	+0.13 - .13	+0.13 - .13	+0.13 - .13	+0.05 - .00	+0.38 - .00	+0.38 - .00	+0.13 - .13	+0.13 - .13	+0.13 - .13	+0.13 - .13	+0.13 - .13	+0.13 - .13	+0.13 - .13	
1 A	680.4	3.30	5.16	12.70	12.70	5.56	6.35	4.76	5.56	7.14	12.70	6.99	3.97	7.94	2.79	7.62	5.56	12.70	14.22	9.53	7.14	5.28	30
1 B	680.4	3.30	5.16	38.89	12.70	5.56	6.35	4.76	5.56	7.14	12.70	6.99	3.97	7.94	2.79	7.62	5.56	12.70	14.22	9.53	7.14	5.28	30
1 C	680.4	3.30	5.16	12.70	12.70	5.56	6.35	4.76	5.56	7.14	12.70	6.99	3.97	7.94	2.79	7.62	5.56	12.70	14.22	9.53	7.14	5.28	30
1 D	680.4	3.30	5.16	38.89	12.70	5.56	6.35	4.76	5.56	7.14	12.70	6.99	3.97	7.94	2.79	7.62	5.56	12.70	14.22	9.53	7.14	5.28	30
2 A	975.2	3.99	5.16	12.70	14.29	5.56	8.33	4.76	5.56	7.94	12.70	8.33	4.76	7.94	2.79	11.11	5.56	12.70	15.88	9.53	8.33	7.14	30
2 B	975.2	3.99	5.16	38.89	14.29	5.56	8.33	4.76	5.56	7.94	12.70	8.33	4.76	7.94	2.79	12.70	5.56	12.70	17.46	9.53	8.33	7.14	30
2 C	975.2	3.99	5.16	12.70	14.29	5.56	8.33	4.76	5.56	7.94	12.70	8.33	4.76	7.94	2.79	12.70	5.56	12.70	17.46	9.53	8.33	7.14	30
2 D	975.2	3.99	5.16	38.89	14.29	5.56	8.33	4.76	5.56	7.94	12.70	8.33	4.76	7.94	2.79	12.70	5.56	12.70	17.46	9.53	8.33	7.14	30
3 A	1,361	4.70	5.95	12.70	15.88	7.14	9.92	5.56	6.35	9.53	15.88	9.92	6.35	8.73	2.79	15.88	6.35	15.88	20.64	11.51	9.92	7.94	28
3 B	1,361	4.70	5.95	34.93	15.88	7.14	9.92	5.56	6.35	10.32	15.88	9.92	6.35	8.73	2.79	15.88	6.35	15.88	20.64	11.51	9.92	7.94	28
3 C	1,361	4.70	5.95	12.70	15.88	7.14	9.92	5.56	6.35	9.53	15.88	9.92	6.35	8.73	2.79	15.88	6.35	15.88	20.64	11.51	9.92	7.94	28
3 D	1,361	4.70	5.95	34.93	15.88	7.14	9.92	5.56	6.35	10.32	15.88	9.92	6.35	8.73	2.79	15.88	6.35	15.88	20.64	11.51	9.92	7.94	28
4 A	1,814	5.41	6.73	12.70	17.46	8.73	10.72	6.35	7.14	12.70	17.46	10.72	6.35	11.11	5.16	15.88	7.14	17.46	22.23	12.70	11.11	9.53	26
4 B	1,814	5.41	6.73	31.75	17.46	8.73	10.72	6.35	7.14	12.70	17.46	10.72	6.35	11.11	5.16	15.88	7.14	17.46	22.23	12.70	11.11	9.53	26
4 C	1,814	5.41	6.73	12.70	17.46	8.73	10.72	6.35	7.14	12.70	17.46	10.72	6.35	11.11	5.16	15.88	7.14	17.46	22.23	12.70	11.11	9.53	26
4 D	1,814	5.41	6.73	31.75	17.46	8.73	10.72	6.35	7.14	12.70	17.46	10.72	6.35	11.11	5.16	15.88	7.14	17.46	22.23	12.70	11.11	9.53	26
5 A	2,608	6.50	7.94	12.70	19.05	7.94	11.91	7.14	7.94	14.29	19.05	11.91	7.14	14.29	5.16	15.88	7.94	19.05	22.23	13.49	12.30	11.11	24
5 B	2,608	6.50	7.94	31.75	19.05	7.94	11.91	7.14	7.94	14.29	19.05	11.91	7.14	14.29	5.16	15.88	7.94	19.05	22.23	13.49	12.30	11.11	24
5 C	2,608	6.50	7.94	12.70	19.05	7.94	11.91	7.14	7.94	14.29	19.05	11.91	7.14	14.29	5.16	15.88	7.94	19.05	22.23	13.49	12.30	11.11	24
5 D	2,608	6.50	7.94	31.75	19.05	7.94	11.91	7.14	7.94	14.29	19.05	11.91	7.14	14.29	5.16	15.88	7.94	19.05	22.23	13.49	12.30	11.11	24
6 A	3,810	8.08	9.53	12.70	22.23	7.94	12.70	8.33	9.53	15.88	22.23	12.70	7.94	14.29	6.75	14.29	9.53	22.23	22.23	15.88	15.08	11.91	22
6 B	3,810	8.08	9.53	28.58	22.23	7.94	12.70	8.33	9.53	15.88	22.23	12.70	7.94	14.29	6.75	14.29	9.53	22.23	22.23	15.88	15.08	11.91	22
6 C	3,810	8.08	9.53	12.70	22.23	7.94	12.70	8.33	9.53	15.88	22.23	12.70	7.94	14.29	6.75	14.29	9.53	22.23	22.23	15.88	15.08	11.91	22
6 D	3,810	8.08	9.53	28.58	22.23	7.94	12.70	8.33	9.53	15.88	22.23	12.70	7.94	14.29	6.75	14.29	9.53	22.23	22.23	15.88	15.08	11.91	22

4P1.—Specifications for Turnbuckles.

Fig. 1.—Eye fork type. The eye shall have left-hand threads and the fork right-hand threads; for double-eye type one end shall have left-hand threads and the other right-hand threads.



such strands twisted concentrically around a central strand of the same construction forming a cable.

(b) The general specifications, 1G1, shall form, according to their applicability, a part of these specifications.

MATERIAL.—2. The wire shall be manufactured of either I.A.S.B. standard steel No. 1065, No. 1070, or No. 1080, the compositions of which are listed below.

MANUFACTURE.—3. (a) The steel wires composing the individual strands of cable shall be laid concentrically around the centre wire in one layer of 6 wires and another, or outer layer of 12 wires with a left-hand (counter clockwise) pitch, the lay or pitch of both layers being of the same length; the cable itself shall be constructed by twisting 6 of these strands composed of 19 wires each around a seventh strand of the same construction and material with a right-hand (clockwise) pitch or lay of 6 to 8 times the diameter of the whole.

It is not to be understood that the strand composing this cable must necessarily be composed of wires of the same diameter.

(b) The steel from which the wires composing the cable are drawn shall be manufactured by the acid open-hearth process.

(c) Wires composing the cable shall be uniformly coated with pure tin to solder readily.

(d) Joints in wires in cable having a diameter of 0.187 (3/16 in. (4.76 mm.) and larger shall be brazed in a gas fire. In cable having a diameter of 0.156 (5/32 in. (3.97 mm.) or less, wires may be joined either by brazing or twisting at the manufacturer's convenience. Tucked in or welded joints are not permitted. No two joints in individual wires shall be closer to one another in the completed cable than 30 ft. (9.14 m.).

WORKMANSHIP AND FINISH.—4. Each length of cable is to be evenly laid and free from kinks, loose wires, or other irregularities. The cable shall remain in this condition when unwound from the reel or bent around a standard thimble proper precautions being taken to secure the ends.

PHYSICAL PROPERTIES AND TESTS.—Tensile Test.—5. (a) A tensile test shall be made upon each individual reel of cable purchased of a size.

(b) Samples of cable for testing for tensile strength shall be no less than 24 in. (610 mm.) in length. In making tensile tests the distance between jaws of testing machine with sample in place and before test shall be not less than 10 in. (254 mm.).

(Continued on page 205.)

CHEMICAL COMPOSITION OF STANDARD CARBON STEELS.

Number.	Carbon.	Manganese.	Phosphorus, maximum.	Sulphur, maximum.
1065	0.60-0.70	0.50-0.70	0.040	0.045
1070	.65-.75	.50-.70	.040	.045
1080	.75-.90	.25-.50	.040	.045

TABLE OF WEIGHTS, SIZES AND STRENGTH OF CABLE.

ENGLISH UNITS.			METRIC UNITS.		
Diameter, inches.	Minimum breaking strength, pounds.	Approximate weight, pounds per 100 feet.	Diameter, millimetres.	Minimum breaking strength, kilograms.	Approximate weight, kilograms per 100 metres.
0.375 (3/8)	14,400	26.45	9.525	6,532	39.36
.344 (11/16)	12,500	22.53	8.731	5,670	33.53
.312 (5/16)	9,800	17.71	7.938	4,445	26.35
.281 (9/32)	8,000	14.56	7.144	3,629	21.67
.250 (1/4)	7,000	12.00	6.350	3,175	17.86
.218 (7/32)	5,600	9.50	5.556	2,540	14.14
.187 (3/16)	4,200	6.47	4.763	1,905	9.63
.156 (5/32)	2,800	4.44	3.969	1,270	6.61
.125 (1/8)	2,000	2.88	3.175	907	4.29

REELS FOR CABLE.

ENGLISH UNITS.

1,000 feet.				3,000 feet.			
Diameter of strand or cable.	Diameter of head.	Traverse or distance between heads.	Diameter of bundle.	Diameter of arbor hole.	Diameter of head.	Traverse or distance between heads.	Diameter of bundle.
Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
1/32	12	4	8	1 1/2	12	4	8
1/16	12	4	8	1 1/2	12	4	8
5/64	12	4	8	1 1/2	16	4	10
3/32	12	4	8	1 1/2	16	4	10
7/64	16	4	10	1 1/2	16	7	12
1/8	16	4	10	1 1/2	16	7	12
3/64	16	7	12	1 1/2	16	10	8
5/32	16	7	12	1 1/2	16	10	8
3/16	18	7	12	2 1/2	18	10	8
7/32	18	7	12	2 1/2	18	10	8
1/4	18	10	10	2 1/2	24	10	10
5/16	18	10	10	2 1/2	24	10	10
11/32	18	10	8	2 1/2	32	16	16
3/8	18	10	8	2 1/2	32	16	16

METRIC UNITS.

305 metres.				914 metres.			
mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
0.794	305	102	203	28.58	305	102	203
1.588	305	102	203	28.58	305	102	203
1.984	305	102	203	28.58	406	102	254
2.381	305	102	203	28.58	406	102	254
2.778	406	102	254	28.58	406	178	305
3.175	406	102	254	28.58	406	178	305
3.572	406	178	305	28.58	406	254	203
3.969	406	178	305	28.58	406	254	203
4.763	457	178	305	53.98	457	254	203
5.556	457	178	305	53.98	457	254	203
6.350	457	254	254	53.98	610	254	254
7.938	457	254	254	53.98	610	254	254
8.731	457	254	203	53.98	813	406	406
9.525	457	254	203	53.98	813	406	406

ENGLISH UNITS.

5,000 feet.				10,000 feet.			
Diameter of strand or cable.	Diameter of head.	Traverse or distance between heads.	Diameter of bundle.	Diameter of arbor hole.	Diameter of head.	Traverse or distance between heads.	Diameter of bundle.
Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
1/32	12	4	8	1 1/2	16	4	10
1/16	16	4	10	1 1/2	16	7	12
5/64	16	7	12	1 1/2	16	10	8
3/32	16	7	12	1 1/2	16	10	8
7/64	16	10	8	1 1/2	18	10	8
1/8	16	10	8	1 1/2	24	10	10
3/64	24	10	10	1 1/2	24	16	10
5/32	24	10	10	1 1/2	24	16	10
3/16	24	10	10	2 1/2	24	16	10
7/32	24	10	10	2 1/2	32	20	16
1/4	32	18	16	2 1/2	36	22	18
5/16	32	18	16	2 1/2	36	22	18
11/32	32	20	16	3 1/2	50	16	26
3/8	32	20	16	3 1/2	50	16	26

METRIC UNITS.

1,524 metres.				3,048 metres.			
mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
0.794	305	102	203	28.58	406	102	254
1.588	406	102	254	28.58	406	178	305
1.984	406	178	305	28.58	406	254	203
2.381	406	178	305	28.58	406	254	203
2.778	406	254	203	28.58	457	254	203
3.175	406	254	203	28.58	610	254	254
3.572	610	254	254	28.58	610	254	254
3.969	610	254	254	28.58	610	406	254
4.763	610	254	254	53.98	610	406	254
5.556	610	254	254	53.98	813	508	406
6.350	813	457	406	53.98	914	560	457
7.938	813	457	406	53.98	914	560	457
8.731	813	508	406	79.38	1,270	406	660
9.525	813	508	406	79.38	1,270	406	660

In making racks for the above reels allow a 4-in. or 102-mm. greater width than the traverse specified above.

(Continued from page 204.)

(c) Samples for tensile test may be clamped in the jaws of the testing machine in the usual manner to facilitate testing, but in case of failure or dispute on individual tests, and at the request of the manufacturer, check tests shall be made by socketing the samples with pure zinc.

(d) Cable for use in the construction of aircraft shall meet the required breaking strength specified in the table.

Bend Test.—(e) One bend test is to be made on a sample cut from each reel of cable of a given size. Each sample must be bent once around its own diameter and straightened again at least 20 times in succession in the same direction of bending without any of the wires breaking.

Torsion Test.—(f) A torsion test is to be made on one wire from each sample of cable taken for tensile test. The wire is to be gripped by two vices 8 in. (203 mm.) apart; one vice shall be turned uniformly at as high a rate of speed as possible without perceptibly heating the wire. One vice shall have free axial movement in either direction.

(g) The number of complete turns which the wire shall stand is determined by the formula:

Number of turns

$$= \frac{2.2}{\text{diameter in inches}} - \frac{55.9}{\text{diameter in millimetres}}$$

(h) Failure of one piece of wire to show full number of turns specified in the above torsion test shall not be considered cause for rejection, but in such case two additional tests shall



Seaplane v. Submarine.

THE following story of the destruction of a submarine by a French seaplane was semi-officially issued in Paris on Feb. 14th:—

Quite recently, while patrolling the Channel, two of our seaplanes observed an enemy submarine floating on the surface. Making a sharp turn, the pilot of the leading seaplane brought his machine into such a position towards the sun that he could see better without being seen. He then proceeded to attack the submarine, followed by the second seaplane. The submarine submerged, but the conning tower had not disappeared before the seaplanes, having dived to a low altitude, dropped their bombs right on their objective.

be made on two more wires from the same sample of cable, and if both samples meet the requirements of the specification, the cable shall be accepted in this respect.

DIMENSIONS AND TOLERANCES.—6. There shall be no permissible variation in diameter below size. Cable having a diameter of 0.125 ($\frac{1}{8}$) to 0.187 ($\frac{3}{16}$) in. (3.18 to 4.76 mm.), inclusive, shall have a permissible variation of 10 per cent. above size, and cable having a diameter of 0.218 ($\frac{7}{32}$) to 0.375 ($\frac{3}{8}$) in. (5.56 to 9.53 mm.), inclusive, shall have a permissible variation of 7 per cent. above size.

DELIVERY, PACKING AND SHIPPING.—7. (a) All cable shall be shipped on reels in lengths as specified on orders.

(b) The dimensions of reels for different lengths and sizes of cable shall conform to the table attached to this specification.

(c) A tinned or galvanised steel seal wire of approved design shall pass around no less than three convolutions of the cable on the reel and shall pass through a linen tag showing the name of the manufacturer, the size and length of cable on the reel, the order number or other distinguishing marks, and a record of the test for tensile strength. A lead seal impressed with the official stamp of the representative of the Government making the inspection shall secure the ends of this seal wire and furnish evidence of inspection and acceptance.

(d) The outer layers of cable on a reel ready for shipment shall be protected from mechanical injury in handling and transportation by an efficient covering of burlap.

(To be continued.)

The leading machine then returned to its base for a further supply of bombs, leaving the other machine to keep a lookout. The latter, a few seconds after the attack, saw the fore part of the submarine emerge at an angle of 45 degrees. Then the submarine slowly rose to the surface, without, however, being able to regain a horizontal position, and again disappeared in a violent whirlpool.

Three times at short intervals the submarine attempted to rise to the surface, taking at each attempt a stronger list to starboard. Then the observer saw the whole of the submarine's port side exposed, while the submarine rested on its beam ends. Finally, the vessel disappeared without having succeeded in getting its conning tower above water.



AIRISMS FROM THE FOUR WINDS

SIR WILLIAM WEIR, whilst retaining his position on the Air Council, has been appointed a member of the Munitions Council in charge of aircraft production.

MARCH 12TH is the date upon which reprisals in respect of the sentence of penal imprisonment upon the British flying officers, Capt. Scholz and Lieut. Wookey, is due to take place, without in the meantime the German Government cancels this scandalous decision. Formal notice to this effect was handed in at Berlin on Feb. 12th by the Dutch Minister on behalf of the British Government.

QUITE an interesting little exhibition by one of the British airships was made on Feb. 15th over the centre of London, the dirigible at one time being at such a low altitude, when it was circling for the third time round the roof of "FLIGHT" offices, that for the moment we wondered whether we were in for the honour of a call from the commander. But with a graceful curve she sheered off and displayed her streamlined beauty to other denizens of the metropolis.

Country Life last week had, from a correspondent, quite a suggestive little story upon the joining up of an aeroplane in a fox hunt. "On Jan. 29th," it read, "while running we saw an aeroplane following us overhead about 100 ft. up. The airman waved us the direction in which our fox had gone, and when we checked we heard several holloas from aloft and were put right by our friend above, the hounds

verifying his information. A little later he landed in a field, told the master where he had seen the fox, then rose and circled above us. But the fox beat us."

COMMENTING upon the incident, a contemporary suggests that it is probably the first instance of the sort. This is, however, not so. There have been one or two records of similar character in the early days, a Henry Farman taking part in France in *la chasse*, and again in July, 1915, a case was recorded from America which at the time was described as follows: "Hunting wild game from an aeroplane is a sport which appears to be in a fair way to become popular with our cousins on the other side. The hilly country near Rosco, California, has been the scene recently of several hunting parties of this description, the sharpshooter being Fred Mills, and the man at the wheel the well-known Californian pilot, Glenn Martin. The plane used was one of the Martin tractor biplanes. Circling round over the surrounding country in wide circles, at a height of 3,000 ft., Mills studied the ground below through his field glasses, and soon discovered a prowling coyote and his mate stalking a covey of quail. Shutting off the engine, the party glided down to within a hundred yards of the unsuspecting coyote, the machine was brought to an even keel, and Mills, leaning out of his cockpit and steadying himself against one of the inner plane struts, struck the animal down with a well directed shot. A similar fate overtook the other coyote. While the aviators were walking about picking up the dead animals a third unwisely approached within range and was promptly added to the bag. It appears that so noiseless had been the approach of the hunting party, coming down in a glide with the engine cut off, that the animals in the nearest vicinity of the landing place had heard nothing, and before starting for home the hunters were able to shoot a couple of bobcats, which were loaded on board with the rest of the game." In America when they are out for sport they are out some.

OUR supply of aeroplanes, according to so high an authority as Mr. Bonar Law, was multiplied two and a-half times in 1917 as compared with 1916.

NOTE that Major T. Orde Lees, R.M.L.I., attached R.F.C., is included in the list which the King has approved for the grant of the Polar Medal with Clasp, inscribed "Antarctic, 1914-16," of the Sir Ernest Shackleton's Imperial Trans-Antarctic Expedition. Major Orde Lees, who receives the "Endurance" Party Silver Medal, was the experimenter from the Tower Bridge some short time back with the "Guardian Angel" Parachute.

IF only half the "eggs" which will be provided by the 55 million pounds being sanctioned for aeroplane bombs, in the Deficiency Appropriation Bill of the United States War Budget, are well and truly laid in the year's operations—well there ought to be some fairly big flights observed from Rhineland and other picturesque spots, if our Allies see that too many of them are not added.

A HINT to "young bloods": "I wish we had three dozen more like him. He is not like the bumptious young bloods who hold red cards, and come in when they like, demand what they like, and 'mike' half their time," an aeroplane parts maker told the Surbiton Tribunal last week concerning an exempted man who had to find work of national importance."

WITH the reprisal bombing season coming on, the Germans are for about the first time really up against our past problems of how to dodge the gifts from above. Without much doubt they are benefiting from our experience, as apparently most of their past hysterical anathema is being neglected in favour of the promotion of practical schemes for protection. According to the *Frankfurter Zeitung* the Frankfurt authorities have now decided that no alarms should be given in the event of air raids at night; it seems that the present rule is that there shall be no alarm between 11.30 p.m. and 5 a.m.

It was argued at a conference between the military and municipal authorities that alarms, if they are given at all, must be given as soon as an enemy airman comes within about 60 miles of the town, even if it is not known what direction he is going to take. It was said that this would lead to constant uneasiness, which would involve many dangers, especially the danger of lights being lit near uncovered



The marriage of Wing-Commander Frank K. McClean, R.N.A.S., to Miss Aileen Wale on February 16th. The couple leaving St. Paul's, Knightsbridge, after the ceremony. Wing-Commander McClean is one of the earliest pioneers of aviation, and amongst other very helpful work it was through his practical assistance that the first naval air pilots were initiated into the art of flying.

windows. It was also urged that the flight to refuges may lead to accidents in the dark, and that it is much better for invalids and small children to be at home. All these views were pressed by the military authorities, and were finally accepted by the municipal authorities, especially as Freiburg, Trier and Saarbrücken, which were described as "specially menaced by night raids," have abandoned their former practice of giving alarms at night.

At long last an Order in Council, under date Feb. 18th, has been issued prohibiting exports of linen manufactures other than wearing apparel, to all destinations, without a war trade licence.

WHEN we first came across "aeridheacht," in connection with a Sinn Fein meeting, we wondered what sort of a machine it was, but the Irish member of our staff says "Shure it's Irish for 'meeting.'"

RAIDS AND RUMOURS.

THE BIRTH OF TALL STORIES. By CLARENCE WINCHESTER.

"I have it on the best authority," said the loud-voiced man in the Underground train. "My sister-in-law has a distant relative who is a third-class—no, I mean a first-class—air mechanic at Blankety aerodrome, and he knows."

The Interested One edged closer to the loud-voiced man. "Yes," he said, "I suppose he would get to hear of these things—a first-class air mechanic, too!"

"Ah, my boy, the Huns will have to answer for it the next time they come over here, I can tell you. It's the greatest stunt—yes, that's what they call it in the R.F.C.—on record. And let me tell you, it's a strict secret. You see, we shall let the Gothas cross the coast and come up the Thames a bit. When they get within the range of the new guns they will be fired—the guns, not the Gothas—and the electric shells will burst near the enemy airmen, who will at once collapse from electric shock."

"It sounds simple enough," remarked the Interested One.

"Simple? It's as easy as kiss your hand," replied the loud-voiced man. "But that's not all. If the Boche doesn't take to electricity, there's the new aerial magnet waiting for him. They are fixed all along the Kentex coast at different intervals. At the warning they point skywards and when the raiders come the magnetic power attracts the steel parts of the Gothas and draws the enemy down to the magnet. Like the Gothas, these magnets are gigantic things."

At this stage of the conversation the man who proudly imparted the hot-air knowledge to his companion stretched his legs, and bellowed, "That also is a strict secret. The whole art of air warfare is based on its element of surprise."

"An aerial magnet would be a surprise to the Hun,"

unconsciously remarked the Interested One. "And so would the electric shell!"

Two young Royal Flying Corps pilots on the opposite side of the carriage smiled sardonically. Said one to the loud-voiced man, "I suppose you have heard of the new camouflage buses that we are flying now?"

The loud-voiced man had not.

"Well," continued the pilot, "they are covered with cotton wool in imitation of clouds and when the Huns see them they put their Gothas into the sheds in fear of rain! And so raids on London grow fewer."

"Now, that's something like an idea. Upon my soul, my sister-in-law's distant relative must have forgotten to tell us that," bellowed the Voice.

Not to be outdone the other pilot joined in. "Then, of course," he said as seriously as circumstances allowed, "there is another expert scheme. Balloons are sent up all round London. They are connected by chains and when the Gothas come along they trip over them, with sad results to the poor old Boche. We have also the 'mobile guns,' seen only by one's friends but never by one's self. You hear them rattling about the streets on raid nights, but you never see them. That's just one of their funny ways. They never will be seen. You might not think a 15-mile-an-hour movable gun could chase a 90-mile-an-hour Gotha along the street, but some people think so!"

The car pulled up with a jerk at Leicester Square Station and the pilots rose to make their way along the carriage.

"Don't forget that they're strict secrets," called back one eaglet to Rumour with the Loud Voice.

How the aeroplane can fill an emergency want is emphasised in the report of the Committee of the Red Cross Society. It is stated that on one occasion, when a delay in the cross-Channel service prevented a particular surgical instrument being sent to France for a special operation, the Stores Department was able, through their transport officer at Folkestone, to deliver the instrument by aeroplane within a few hours of receipt of the telegram.

WHAT a story of daring it is, the combined seaplane and armed motor-launch raid into the Bay of Buccari, in the Gulf of Fiume, by Italian officers, including the Italian poet Signor D'Annunzio, who has been erroneously reported as prisoner in the hands of the Germans, as told from Milan.

In a letter to a friend the poet says: "On the night of February 10th, with three armed motor-launches and three seaplanes, we forced our way into the Gulf of Quarnero. What a magnificent adventure! I was 23 hours on the sea, eight of which I spent in the very throat of the enemy, or rather, I should say, in the depths of his stomach. Never was there such a real dream. We were quite alone in our little



"Australian Official."
On the British Western Front.—Preliminaries to a bombing expedition.

boat. We passed through the Faresina channel with an impudence akin to madness. We steered less than 50 yards from the Austrian coast, and in the narrow Bay of Buccari we remained for a space of 35 minutes.

"Having torpedoed a ship which was anchored there, we made our exit amidst the roar of the explosion. I left, floating on the water, three bottles which flamed with the three colours of Italy, and the astonishment of the Austrians must have been immense. The sentries fired wildly. As our third motor-boat had engine troubles we turned back into the Faresina channel, and moved about there as if we were the owners of the place indeed. The sentries, apparently unable to believe that we were Italians, ceased firing altogether."

It required the conception of a poet to devise the coloured flame bottle "stunt."

The following is the text of the message which D'Annunzio enclosed in the bottles:—

"Contemptuous of the cautious Austrian Fleet which occupies itself behind the shelter of its guarded ports in nursing the little bit of glory which it won at Lissa, the Italian Navy has come with fire and flame to dispel confidence even in the safest retreat. The Italian Navy laughs at every kind of net and barricade, and is always ready to dare the impossible. With them also has come a good companion, whom you well know the principal enemy, and amongst your enemies the most bitter, to laugh at the price you have placed on his head—Gabriele D'Annunzio."

No wonder it is rumoured that the Austrian Government has set a price on the head of the poet.

APPROPOS the recent reference to the carrying of urgent wounded cases by aeroplane, attention is drawn to the work in this connection, during the Serbian retreat in 1915, when a number of severely wounded officers and others were conveyed by Paulhan and other French pilots from Prizrend to Vallona or Skutari, thus saving the lives of valuable men who could not possibly have kept pace with the retreat.

7 to 1 against and no takers. A Palestine War Office report:—"In the course of patrolling operations one of our aeroplanes was attacked by an enemy formation composed of five scouts and two larger machines. Two out of the five scouts were driven down, whereupon the remaining three broke off the combat. Our airman then pursued the large enemy machines and drove both of them down in the vicinity of Tul Keram (23 miles north-east of Joppa)."

THE AVIATOR'S PHILOSOPHY.

OF two things, one thing is certain. Either you're in the air or you're on the ground.

If you're on the ground there is no need to worry. If you're in the air, one of two things is certain. Either you're flying straight or you're turning over.



Aerial Mails in America.

FOR some time the American Postmaster-General has been considering the question of aerial mails, and it is now announced that such a postal service between Washington, Philadelphia and New York, is to actually commence on May 1st. Offers to supply the five aeroplanes necessary have been invited. The postage will be 1s. an ounce.

Bombs Dropped near U.S. Field Hospital.

AN American field hospital town within our lines was apparently the target for a German aeroplane which flew over last night and dropped a number of extremely heavy bombs, says Reuter's correspondent with the American Army in France. The hospital, in which were a number of wounded, was the nearest building to the places where the German airman dropped two sets of bombs. Luckily none hit where they were intended, although the town and the hospital patients were shaken.

Fifty-five Millions for Aeroplane Bombs.

SOME idea of America's preparations is indicated by the fact that, according to a message from Washington, the Deficiency Appropriation Bill includes over £55,400,000 for the provision of aeroplane bombs.

Allied Raids on German Towns.

A BERLIN official telegram received in Amsterdam on Feb. 11th, states that "31 enemy air attacks on the German homeland were carried out during January, 15 of which were directed against Lorraine and Luxemburg industrial districts, and 14 on open towns. On Ludwigshafen and Freiburg three

If you're flying straight there is no need to worry. If you are turning over, one of two things is certain. Either you fall or you don't.

If you don't fall, there is no need to worry. If you do fall, one of two things is certain. Either you're injured or you're not injured.

If you're not injured, there is no need to worry. If you're injured, one of two things is certain. Either you're injured slightly or you're injured seriously.

If you're injured slightly, there is no need to worry. If you're injured seriously, one of two things is certain. Either you recover or you die.

If you recover, there is no need to worry. If you die, you can't worry.—(From "The Aileron," the organ of No. 1 Training Depot Station, R.F.C.)



FOR WHAT WE HAVE RECEIVED.

I patter in among the chicks,
I titter as they scatter;
I give my little chops some licks,
I strut away much fatter.

L.A.D. in "The Aileron."

A CORRESPONDENT writes that whilst he was standing at the entrance to Cox's Bank, after the "All Clear" had gone last Saturday night, he watched our searchlights pick out a British aeroplane returning from the hunt. The aviator was in great form evidently, as he literally slid down the beam of light, getting bigger and bigger as he approached from a great height. Then, with that dazzling assurance that he and his friends had been aloft and ready, he sped away in the dark.

"A.S.E." represents Amalgamated Society of Engineers.

It also represents Army Service Entirely.

The latter is synonymous of Khaki Conscription at a shilling a day, there or thereabout.

Verb. sap.



attacks each; on Treves, two attacks; on Friedrichshafen, Rastatt, Offenburg, Mannheim, Karlsruhe and Heidelberg, one attack each. Although the number of attacks compared with the previous month was considerably increased, owing to the favourable weather, the damage and casualties were fortunately smaller. Five persons were killed and nine wounded, while the material damage done was insignificant. There was no resultant interruption of work worth mentioning. The enemy lost four aeroplanes in the course of these attacks."

More New Zeppelins and Gothas?

TWO enormous new Zeppelins made their first aerial trials above Lake Constance on Feb. 10th, says Mr. H. Patrick Devitte, the *Daily Express* correspondent at Geneva. They are now to be sent to a German port.

It is stated that 12 new Gothas are approaching completion on the lake side.

Another version says that the new Zeppelins will carry a perfected system of gas emission to conceal their movements.

Two Hun Machines in Denmark.

A MESSAGE from Copenhagen on Feb. 15th stated that two German aeroplanes had landed on the Danish island of Manoe a few days previously, and that the four occupants had been interned.

And One in Switzerland.

ANOTHER German aeroplane, said to be returning from a raid over French territory, landed on Swiss soil, about 300 yards from the frontier, on Feb. 15th, and the pilot and observer have been interned.

Personals

Casualties.

Lieutenant JOHN HAY CALDWELL, Cameron Highlanders, attached R.F.C., killed on January 24th, was the only son of Mr. and Mrs. W. H. Caldwell, of Morar, Inverness-shire. Born in 1894, he was educated under Mr. Bowden-Smith, Bengoe School, Hertford, and at Eton, where he was in Mr. Byrne's house. In 1912, while still at school, he was gazetted to the Lovat's Scouts Yeomanry from the Eton College O.T.C., obtaining a commission in the 3rd Cameron Highlanders in 1914. He was mobilized with his battalion on the outbreak of war, and in 1917 transferred to the R.F.C., with which he was serving when he met his death. A fine athlete, he was Keeper of the Field at Eton in 1912, and obtained his Oppidan Wall, Mixed Wall, and Field colours, also representing Eton at both Rugby and Association. He was a member of the Eton Society, the Athletic Committee, and the Scientific Society.

Lieutenant CECIL STANLEY GASKAIN, R.F.A., attached R.F.C., who was missing on May 7th, 1917, and now presumed killed on that date, was the fourth son of D. H. Gaskain, of 45, Borough High Street, and The Grange, Grove Park, Kent.

Major WILLIAM ROBERT GREGORY, M.C., R.F.C., of Coole Park, Co. Galway, killed on January 23rd, was the only son of the late Right Hon. Sir William Gregory, a distinguished Harrovian. He was educated at Harrow, where he took the first classical scholarship of the year, and went on to New College, Oxford. Afterwards he studied painting in Paris under Blanche, who declared that his work "had reached the highest level of artistic and intellectual merit." He exhibited at the New English and other galleries paintings of West Irish landscape. The Abbey Theatre in its earlier days owed much to the beautiful scenes painted and designed by him, especially for Synge's *Deirdre of the Sorrows*, Mr. Yeats's *Shadowy Waters*, and his mother's (Lady Gregory) *The Image*. He was a fine boxer, and was well known as a cricketer in the Phoenix, and his county club, and was a fearless rider in the hunting field and in point-to-point races. He joined the Connaught Rangers in the autumn of 1915, and in January of 1916 began his training for the R.F.C. He went to France in August, returning to England in the following July after 11 months' continuous active service, and after having been awarded the Military Cross for acts of bravery in the air, and for having "invariably displayed the highest courage and skill," and the Legion of Honour for "many acts of conspicuous bravery." Last autumn he was given command of a Scout Squadron in France, and in November went to another front.

Second Lieutenant FREDERICK DAVID MILLER, R.F.C., the second son of Mr. H. Miller, late of the Military Works Services, India, came to England last April from India, where he was employed in the Irrigation Department, P.W.D., United Provinces, as a temporary engineer. He resigned his appointment to join the Royal Flying Corps, and went out to the front at the end of last December. He was mortally wounded in action over the German lines on the morning of February 4th. His pilot was also wounded, but with great skill and pluck landed safely at one of our aerodromes. Both were taken to the nearest hospital, where Lieutenant Miller died about four hours afterwards. As the result of his last engagement eight out of 12 enemy machines were brought down by his patrol of 10, and the only casualties were in his own machine.

Second Lieutenant WILLIAM REGINALD STINTSON SMITH, R.F.C., was the only son of the late T. B. Smith and Mrs. Smith, of 19, Dene's Mansions. He was educated at Lindley Lodge and at Shrewsbury School, entering Mr. Oldham's house in September, 1912. Before he left in December, 1916, he was a school monitor, a member of the cricket eleven, and a senior "whip." In January, 1917, he joined the R.F.C., gaining his wings in August. In September he was posted to a squadron, and left for France in October. After being there only a fortnight his machine was brought down, and he was reported missing on October 22nd. News has now been officially received that he died of wounds in Germany, aged 19. His O.C. writes that he was a most able pilot and very popular with the squadron. Besides being an excellent cricketer, Second Lieutenant Smith was a fine golfer, being a regular player with the A.D.V. Golf Club.

Mr. VERNON CASTLE, the well-known professional dancer, has been killed in a flying accident. Mr. Castle, who was a Captain in the R.F.C., was an instructor in an American Cadet aviation camp. His plane was 50 ft. above the ground and was moving rapidly, when another machine started to rise. Mr. Castle saw the danger of a collision and undertook a difficult turn. The plane failed to respond and crashed to the ground. Mr. Castle was killed instantly. The cadet in the other machine was injured.

The news of the death of Mr. Vernon Castle was received with deep regret in theatrical circles in London. He was at the zenith of his professional career when some two years ago he decided to join the Army. At that time he and his wife were drawing from £1,500 to £2,000 a week as dancers, and when Mr. Castle decided to give up the stage for the Army, Mr. Charles Dillingham, the well-known New York manager, wanted him to get a Base appointment. He would not do so, however, but came to England, and eventually received a commission in the R.F.C. He went to France, and was engaged in several fights. Later he was sent to Canada to train airmen, and there, some six months ago, had an accident. Afterwards he was lent to the American Army as a training officer. In the United States he did a great deal of propaganda for the Allies. He first went to America some 10 years ago and played eccentric juvenile parts. Five years ago he married an American girl who had never been on the stage, and it was in Paris that she and her husband first appeared as dancing partners with immediate success. Mrs. Castle is at present playing the leading rôle in "The Century Girl" in New York. Mr. Castle was about 34 years of age. His parents live in England.

Sub-Lieutenant CYRIL JEWELL, R.N.A.S., of Henden Manor, Ide Hill, Sevenoaks, and 7, Sloane Street, London, S.W., who was accidentally killed whilst flying in Hampshire on February 8th, was the second son of Henry Jewell, of 132, High Holborn.

Lieutenant LEONARD MONTEAGLE BARLOW, M.C. (with two bars), R.F.C., Special Reserve, who was accidentally killed near Ipswich on February 5th, aged 19, was the eldest of the six children of Mr. and Mrs. Leonard Barlow, of Ben Varne, Wallington. When war broke out he was senior engineering student at the Finsbury Technical College, where he gained both an entrance scholarship and the Salaman research scholarship from the Institution of Electrical Engineers, and was elected a student member of this society. When only 17 he first made application to join the R.F.C., and succeeded in obtaining his commission on his 18th birthday. He went to France with the famous 56th Scout Squadron, to which the late Captain Ball, V.C., D.S.C., M.C., belonged. At daybreak on the morning of the Battle of Messines Ridge he volunteered to fly alone about 30 miles behind the German lines at an altitude not exceeding 150 feet, with the object of preventing enemy observation machines from leaving two aerodromes. This he accomplished most successfully, and was awarded the Military Cross. For a considerable part of the seven months he was in France he was senior in his flight, and led it into numerous actions. He is officially credited with 17 Hun aeroplanes destroyed, and when the total had reached ten he received the first bar to his Military Cross. His second bar was won by rescuing a comrade who was endeavouring to defend himself against great odds in an aerial combat. Before leaving France he was strongly recommended for a captaincy, which he never lived to receive. On returning to England he first became a Scout Pilot Instructor, and subsequently Test Pilot to an Aeroplane Experimental Station, where on February 5th he met his death whilst carrying out some official tests. He had scarcely reached an altitude of 150 feet when the engine failed, and the machine nose-dived to earth and burst into flames. His death is believed to have been instantaneous. His brother, Sub-Lieutenant Harold Monteagle Barlow, R.N.V.R., who had a similar scientific training and has flown, received his commission in the Wireless Experimental Research Department of the Navy at the exceptionally early age of 17. The funeral took place at Bandon Hill, with full military honours.

Flight Lieutenant "JACK" PITT, R.F.C., who died on February 7th of injuries sustained in a flying accident in England, was the youngest son of Mr. and Mrs. Wm. Pitt, of

Mottram-in-Longdendale, Cheshire, and nephew of Mr. Tom Pitt, of the Lyric Theatre, London, aged 19.

Captain H. G. REEVES, R.F.C., has been killed while testing in flight a new machine behind the British lines in France. He was 20, and although he only joined the R.F.C. a year ago and did not go to France till June, he had brought down many German machines. He became Captain in less than six months, was a Flight-Commander, and had acted as Squadron Commander. Once he fought against five machines, drawing their fire on himself by going to assist a comrade who had engine trouble. He brought down their leader and put another out of action, and the others then made off. He was an old boy of St. John's College, Hurstpierpoint.

After serving gallantly and receiving great injuries in France in 1915 and 1916, Flight Sergeant LESTER W. ROWAN, aged 27, of 63, Abingdon Road, Kensington, has been killed while flying in England with his commander on February 4th.

Prisoner of War.

Alderman Ball, Nottingham, has received a cable from Switzerland stating that his second son, Lieutenant ARTHUR CYRIL BALL, R.F.C., younger brother of the late Captain Albert Ball, V.C., is safe and in good health as prisoner of war in Germany.

Married.

The wedding took place on February 19th, in Little Easton Church, of the Hon. MAYNARD GREVILLE, R.F.C., younger son of the Earl and Countess of Warwick, and DORA, only daughter of the late EDWARD PAPE, of Moor Hall, Battle, and 26, Portland Place, and Mrs. Pape. The bride was given away by her eldest brother, Lieutenant E. L. Pape, R.F.C. Lady Mercy Greville was bridesmaid, and Lieut. R. Joynson-Hicks, R.F.C., best man.

On February 4th, at St. Mary Boltons, Lieutenant MAURICE ANTHONY HUNTER FELL, N.Z.R.B., attd. R.F.C., was married to GLADYS MERTON, younger daughter of Mr. George Merton, Christ's College, Christchurch, New Zealand.

On February 12th, at Brompton Parish Church, Major PHILIP BABINGTON, M.C., Royal Flying Corps, fourth son of Charles Babington, of Croan, Wadebridge, was married to JOAN, third daughter of HENRY AVERELL DANIELL, of The Ledgers, Chelsham.

On February 11th, at St. Saviour's, Southwark, Captain GEORGE HORNEY BIRLEY, R.F.C., youngest son of the late Francis Hornby Birley and of Mrs. Birley, was married to MARY, only daughter of RICHARD WILLIAM KNIGHT, of Buckminster, Leicestershire.

The marriage arranged between Lieutenant-Colonel J. A. CHAMIER, D.S.O., Indian Infantry and R.F.C., and Miss EDWINA RATCLIFFE LORDLY, took place at St. Cuthbert's Church, Philbeach Gardens, Earl's Court, on February 20th.

Lieutenant CECIL BANKS LOWETH, R.F.C., was married on February 2nd, 1918, at St. Saviour's Church, Ealing, to MARGUERITE DAISY MITCHELMORE, eldest daughter of Mr. and Mrs. Mitchelmore, Woodfield Road, Ealing.

The marriage of Wing Commander F. K. McCLEAN, Royal Naval Air Service, son of the late Frank McClean, F.R.S., LL.D., of Rusthall House, Tunbridge Wells, and AILEEN, elder daughter of Mr. and Mrs. W. H. WALE, of Lapworth,

Warwickshire, took place on February 16th, at St. Paul's, Knightsbridge.

On February 2nd, at St. Mary's Church, Farnborough, Captain FRANCIS JUSTIN MILLER, R.F.C., son of Mr. and Mrs. Albert P. Miller, of Stone, Staffs., was married to DOROTHY MARGARET, second daughter of the Rev. and Mrs. A. E. DAMS, The Vicarage, Goring-on-Thames.

On February 9th, at Holy Rood Church, Crofton, Hants, Flight Sub-Lieutenant WILLIAM MATTHEWS SHOOSMITH R.N., was married to DOROTHY, daughter of CHARLES GREENWOOD, late Captain, 4th Border Regiment (Militia).

On February 14th, at St. Mark's Church, Farnborough, Captain F. A. SHORT, R.F.C., was married to MARION CHRISTABEL, daughter of the late CHARLES VALENTINE, of Oxford.

On February 16th, at the Church of the Sacred Heart, Hove, Lieutenant CLAUDE SWAIN, R.F.C., elder son of Captain SWAIN, R.A., of Beech Grove, Haylands, Ryde, was married to IRIS, elder daughter of Mrs. BERNARD HILLMAN, 33, First Avenue, Hove.

To be Married.

The engagement is announced of Captain T. GRANT, M.C., R.F.C., to Miss LILY ST. JOHN. Miss St. John is now playing in "Yes, Uncle!" at the Prince of Wales Theatre.

The engagement is announced of Lieutenant WALLACE FERRIER HAMILTON, R.F.C., youngest son of Mr. and Mrs. Claude Hamilton, of Macedon, Victoria, Australia, and ELSIE, only child of Mr. and Mrs. ERNEST MITCHELL, of 8, Ingles Road, Folkestone.

A marriage is arranged, and will take place on February 25th, at St. Mary Abbots Church, Kensington, between Captain SIDNEY ROBERT STAMMERS, R.F.C., eldest son of Mr. and Mrs. S. J. R. STAMMERS, of Beaconsfield, Gunnersbury, and MURIEL, only daughter of Mr. and Mrs. H. G. MUSKETT, Montrose, Gerrards Cross, Bucks.

Items.

Commodore Godfrey Paine (Master-General of Personnel, Air Council) had the honour of being received by His Majesty at Buckingham Palace on the evening of February 19th.

Lieut. T. B. Bruce, R.F.C., had the honour of being received by the King at Buckingham Palace on February 14th.

By the death of Lord Foley on February 14th, at his residence, Ruxley Lodge, Claygate, Surrey, at the age of 65, the barony passes to his cousin, Gerald Henry Foley, who was until recently a second lieutenant in the R.F.C., an accident while flying incapacitating him from further service. The late Lord Foley was formerly captain and hon. major of the 3rd Sherwood Foresters, Derbyshire Regiment, and was known as an excellent all-round sportsman. Lord Foley, who succeeded his brother as sixth baron in 1905, was unmarried.

Second Lieutenant GEOFFREY NEILD WHITEHEAD, R.F.C., of Reevadale, Menston-in-Wharfedale, and of Messrs. W. and J. Whitehead, worsted spinners, New Lane Mills, Laisterdyke, who was killed in Belgium on October 15th, left property of the gross value of £136,508, with net personality £133,641.



Fatal Accidents.

A HERTFORDSHIRE Coroner on Feb. 11th held an inquest on 2nd Lieut. D. Q. Ellis, attached R.F.C., whose machine on Feb. 8th collided with another controlled by Cadet Steadman. Both aeroplanes became locked and descended in flames. Lieut. Ellis's body was extricated from the wreckage, while Steadman was removed to hospital seriously injured. They had been flying about 50 yards apart facing the sun, and swerved into each other.

Two naval airmen were killed at Sherborne St. John, Hants, on Feb. 9th. Descending, the machine was noticed to wobble badly, and when nearing the ground it became a mass of flame. One occupant threw himself clear of the machine, but broke his back in falling, and the other, unable to extricate himself, was burned to death.

An inquest was held by the Norfolk Coroner on Feb. 13th on 2nd Air-Mech. G. A. Gillard, a pupil in the R.F.C., who was killed the previous day through his machine getting into a spinning nose-dive when about 200 ft. from the ground.

An officer advanced the theory that Gillard might possibly have fainted and fallen forward on to the controls.

Medical evidence showed that death was instantaneous, and the jury returned a verdict of "Accidental Death."

"Accidental Death" was the verdict on Lindley H. de Garno, of New York, cadet in the American aviation service, attached to the R.F.C., who was killed in an aeroplane accident in Hertfordshire.

Girl Killed by Aeroplane.

At the inquest on an 11 year old girl at Shildon, Durham, on Feb. 13th, it was stated that she was killed by a machine, piloted by 2nd Lieut. A. Birkbeck, R.F.C., which failed to clear a hedge. The evidence showed that it was impossible for the pilot to see the child, and the jury exonerated him from blame.

R.F.C. Officer Shot.

It was reported on February 15th that Lieut. Geoffrey Bulmer, R.F.C., of Long Meadow, Hereford, was found shot that morning in a room at the St. Ives Hotel, Paddington. He was taken to St. Mary's Hospital, but died soon after admission.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters, February 12th.
"On the 11th inst. mist, high winds, and low clouds again made weather conditions unfavourable for flying. Little work was possible with the artillery, but our aeroplanes carried out several successful reconnaissances, and dropped over a ton of bombs on various targets behind the enemy's lines. No fighting took place. To-day, our machines carried out a raid into Germany and bombed the town of Offenburg. Details of this raid have not yet been received."

General Headquarters, February 13th.
"On the 12th inst. weather conditions again rendered flying practically impossible. Work in conjunction with the artillery was attempted, and a few hostile batteries were engaged. Bombs were also dropped by our aeroplanes on various targets behind the enemy's lines, and machine-gun fire was opened from the air upon his trenches. In the raid carried out by us yesterday into Germany, over one and a quarter tons of bombs were dropped on the barracks and railway station south of Offenburg with excellent results. Several direct hits were observed on the railway station and line and on a railway workshop. Several bursts were seen also in the vicinity of the barracks. Two fires were started in the town. One of our aeroplanes also carried out a successful reconnaissance of hostile aerodromes in Germany. All our machines returned."

War Office, February 13th.
"Palestine Front.—Since the issue of the last communiqué on February 7th, active operations have mainly been restricted to the Air Service. On February 12th a successful bombing raid was carried out by Australian flying units on the railway station at El Kutrani (on the Hedjaz railway, 80 miles north of Maan); 1,040 lbs. of bombs were dropped, and 14 direct hits obtained on the station buildings, track, locomotives, and rolling-stock. All our machines returned safely. In the course of patrolling operations one of our aeroplanes was attacked by an enemy formation composed of five scouts and two larger machines. Two out of the five scouts were driven down, whereupon the remaining three broke off the combat. Our airman then pursued the large enemy machines and drove both of them down in the vicinity of Tul Keram. The operations of the Arab forces of the King of the Hedjaz are being continued with success. Repeated raids have been effected against the Hedjaz railway north of Medina, and important demolitions have been effected."

"Salonica.—An enemy aeroplane was shot down in an air fight near Topoljani (east of Seres)."

General Headquarters, February 14th.
"On the 13th inst., little work was possible owing to low clouds and rain. A few reconnaissances were carried out by our aeroplanes in the early morning, and bombs were dropped on various targets."

General Headquarters, February 15th.
"On the 14th inst. low clouds and mist continued and greatly impeded flying. In spite of these unfavourable conditions reconnaissances were attempted by our aeroplanes, and a few bombs were dropped behind the enemy's lines. A hostile convoy and troops on the road were attacked with machine-gun fire from a low altitude. One of our machines is missing."

General Headquarters, February 16th.
"On the 15th inst. the weather was again overcast and misty, but our aeroplanes carried out several reconnaissances. A few bombs were dropped and machine-gun fire was opened on the enemy's trenches and on various other targets behind his lines."

"Last night our machines dropped bombs on Menin railway station and sidings and on hostile aerodromes and billets. One German machine landed intact behind our lines, and its occupants were taken prisoner. All our machines returned."

General Headquarters, February 17th.
"On the 16th inst. the weather was very fine and visibility good. Our aeroplanes carried out observation for the artillery all day and took photographs of the enemy's rear lines and aerodromes. Hostile billets, railway stations, and troops were bombed and engaged with machine-gun fire throughout the day. A large calibre German gun was also bombed, and in the course of the day over 5½ tons of bombs were dropped by us on different targets. Fighting machines on both sides were most active, and frequent attacks were made by the enemy on our bombing, photographic, and artillery machines. In air fighting 14 German machines were brought down, and seven others were driven down out of control. Our anti-aircraft guns shot down two other hostile machines, one of them being a large bombing machine, which carried four men. This latter machine fell in our lines and its four occupants were taken prisoners. Another German aeroplane, making the 17th accounted for during the day, in addition to those driven down out of control, landed near one of our aerodromes, and its occupants were also taken prisoners. Five of our aeroplanes are missing."

"During the night of the 16th-17th inst. our machines dropped 400 bombs on hostile aerodromes in the neighbourhood of Ghent, Tournai, and Laon. The railway station and sidings at Conflans—15 miles west of Metz—were also

successfully bombed from a low height, bursts being observed in the sidings. All our machines returned."

Admiralty, February 17th.
"On February 16th a bombing raid was carried out by naval aircraft on Zuydweghe Dump. Many bombs were dropped, and a fire was observed to start in the middle of the objective. All our machines returned safely."

General Headquarters, February 18th.
"The weather was again fine on the 17th inst., and enabled our aeroplanes to proceed with their work in conjunction with the artillery and to take photographs of the enemy's aerodromes and back areas. Bombing, which had been carried out incessantly throughout the previous 36 hours, was continued, and over 6 tons of bombs were dropped by us on various targets, including hostile aerodromes in the neighbourhood of Tournai and Lille, a large ammunition dump near Courtrai, and numerous billets. Fighting in the air was again most severe, the enemy's scouts making determined but unsuccessful attacks against our bombing machines. Ten hostile aeroplanes were brought down and six others were driven down out of control. Three of our machines are missing."

"On the night of the 17th-18th inst., further bombing raids were carried out against hostile aerodromes south of Ghent and west of Tournai as well as against many of the enemy's billets. Another most successful raid was carried out on the railway station and sidings at Conflans (west of Metz). A ton of bombs was dropped, and bursts were observed on sheds at the edge of the sidings, where a large fire was started. Other bursts were clearly seen on the siding and near the railway station. In spite of the exceptionally heavy fire of the enemy's anti-aircraft guns, all our machines returned. On the 18th inst. our bombing squadrons raided the barracks and railway station at Trèves, on the Moselle, and the steel works and railway station at Thionville. The raid was carried out in broad daylight, and excellent results were obtained. At Trèves bombs were seen to burst in the gasworks, near the barracks, and also in the town, where two large fires were burning when our airman left. At Thionville direct hits were obtained on the railway. Anti-aircraft gunfire was again considerable and accurate, but all our machines returned safely."

French.

Paris, February 12th.
"During the day of the 11th, four German aeroplanes were brought down by our pilots, and, in addition, our chaser planes carried out different bombardments. About 9 tons of bombs were dropped on the establishments, dumps, railway stations, and cantonments of the enemy, especially on the railway station of Metz-Sablons, where a fire broke out."

Paris, February 13th.
"Enemy aeroplanes last night dropped several bombs on Nancy. Three persons of the civilian population were killed and five were injured."

"Salonica.—Allied airmen have successfully bombarded Saviak (north-west of Seres), Cestovo, on the Strumnitza-Doiran Railway line, and the enemy encampments in the Tchernia Valley."

Paris, February 14th.
"Between February 1st and 10th, our pilots brought down 28 enemy machines, 14 of them were entirely destroyed and 14 severely damaged."

Paris, February 15th.
"On the night of February 12th-13th our air squadrons dropped over 4,500 kilogrammes (4½ tons) of explosives on the railway stations of Thionville, Conflans, Chambley, and Metz-Sablons. Fires were seen to break out, and explosions were heard in the stations of Chambley and Metz-Sablons."

Paris, February 16th.
"Two enemy aeroplanes last night (Friday) dropped several bombs in the region north of Nancy. A number of killed and wounded are reported among the civil population."

Italian.

Rome, February 12th.
"One of our airmen shot down an enemy aeroplane above Bertaglia."

Rome, February 13th.
"To the east of Conegliano [six miles north-east of British front of Montello] two enemy captive balloons were set on fire by English airmen."

Rome, February 14th.
"On Tuesday an Italian submarine 'attacked and torpedoed an armed enemy steamer near the Isle of Lussin [Adriatic], and, though fiercely attacked by aeroplanes and torpedo-boats, returned undamaged to its base."

German.

Berlin, February 13th.
"As a reprisal for the enemy air raid on Saarbrücken on February 5th, our airmen yesterday evening dropped bombs on the fortress of Nancy with good effect."

Berlin, February 15th.
"During the month of January the enemy lost on the German front 20 captive balloons and 151 aeroplanes, 67 of which fell behind our lines. The rest were seen to fall within the enemy positions."

"In aerial fighting we have lost 68 aeroplanes and four captive balloons."

QUESTIONS IN PARLIAMENT.

Enemy Air Raids.

MR. GILBERT, in the House of Commons on February 14th, asked the Secretary of State for the Home Department whether, owing to the probability of an increasing number of air raids on London and to the services of special police constables being more often required in the future in dangerous areas, he can at once arrange that all constables required for street duty during air raids shall be supplied with steel protection helmets in order that these men, who give their services free, shall run no unnecessary risks?

The Secretary of State for the Home Department (Sir George Cave): Arrangements are being made to reduce the number of special constables assembling on an emergency call, and to increase the supply of steel helmets, and I am informed that helmets will be available for all special constables employed on street duty during air raids.

MR. P. A. HARRIS: Will they be available for people going from their houses to their duty? They often have to go considerable distances.

SIR G. CAVE: I do not think that is possible or necessary, because they always have notice.

MR. HARRIS: Not even in case of air raids?

MR. BILLING: Will the right hon. gentleman use his influence to persuade the Government that the only true defence against aeroplane raids is an air offensive over Germany?

MR. SPEAKER: That does not arise out of the question.

Aerodromes and Agricultural Workers.

GENERAL COLVIN, on February 18th, asked the Under-Secretary of State to the Air Ministry whether, having regard to the fact that men are still being taken away from agricultural employment to work at aerodromes, steps will immediately be taken to obtain the necessary labour from elsewhere, in order to terminate a system which is making farming in some districts almost impossible?

The Under-Secretary to the Air Ministry (Major Baird): Instructions have been issued to contractors that they are to engage labour exclusively through the medium of Employment Exchanges, and the latter are being instructed not to send forward for employment on aerodrome construction men whose last employer was a farmer, or who are known to be agricultural labourers.

MR. BILLING: Are German prisoners still employed on aerodromes under active service conditions?

Major Baird: Yes.

Aviation Ground, Ayrshire.

MR. SHAW asked the Financial Secretary to the War Office whether he can state, approximately, the amount of the expenditure up to date upon, or in connection with, the scheme for an aviation ground in Ayrshire; whether roads and a railway were built, hutments erected, and land reclamation undertaken; whether proper engineering advice was taken before the site was selected and the expenditure incurred; and whether it is proposed to proceed with the scheme?

MR. MACPHERSON: In answer to the first and second parts of the question, the amount expended on works services under the control of the War Office was about £400,000. Roads were built, hutments erected, and land reclamation undertaken. A temporary railway was made for part of the way, and a scheme for a tension considered but refused on account of engineering difficulties. The answer to the third part is in the affirmative. Any question as to the future of this establishment should be addressed to the representative of the Air Board, as that Department is now in control.

Air Force.

MR. JOYNSON-HICKS asked the Under-Secretary of State to the Air Ministry whether the Orders in Council constituting the Air Force have yet been made?

Major Baird: No, Sir. I hope on the Estimates of the Air Ministry to make a full statement as to progress in establishing the Air Force.

The British Air Service

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

Royal Naval Air Service.

Admiralty, February 13th.

Lieutenants, R.N.V.R. (Temp.).—J. P. Bourke and P. Hutchinson, both promoted to Lieut.-Comms., R.N.V.R. (Temp.), seny., Dec. 31st, 1917.

Royal Flying Corps (Military Wing).

London Gazette Supplement, February 12th.

The following appointments are made:—

Flying Officers.—2nd Lieut. G. L. S. Rowell, R.A., and to be sec'd.; Nov. 27th, 1917. Lieut. T. L. Green, Cyclist Bn., T.F., and to be sec'd.; Dec. 6th, 1917. Lieut. B. R. Jellings, R. Welsh Fus., S.R., and to be sec'd.; Dec. 7th, 1917. Temp. Lieut. D. Kingsley, Sea. Highrs., from a Flying Officer (Obs.), with sen. from Nov. 25th, 1916, and to be transd. to R.F.C. Gen. List; Temp. Lieut. C. O. Meeke, A.S.C., and to be transd. to R.F.C. Gen. List; 2nd Lieut. C. A. J. Thompson, Ches. R., S.R., and to be sec'd.; Dec. 8th, 1917. Temp. 2nd Lieut. H. W. Bagges, Gen. List; Dec. 9th, 1917. Capt. A. F. Smith, Ches. R., T.F., and to be sec'd.; Temp. 2nd Lieut. G. T. Legge, E. Surr. R., and to be transd. to R.F.C. Gen. List; Dec. 12th, 1917. Lieut. R. O. Hobbhouse, Som. L.L., T.F., and to be sec'd.; Temp. Lieut. A. A. Cullen, Gen. List, from a Flying Officer (Obs.), sen. from Jan. 27th, 1917; Lieut. T. A. Williams, M.C., Yeo., T.F., and to be sec'd.; Lieut. G. E. Norman, R. Ir. Rif., S.R., from att'd. Garr. Bn. R. Ir. Fus.; Dec. 18th, 1917. Capt. G. G. Bell, Canadian Exped. Force, from a Flying Officer (Obs.), sen. from Jan. 9th, 1917; Lieut. H. Radloff, Lond. R., T.F., and to be sec'd.; Temp. 2nd Lieut. S. B. Hicks, K.R.R.C., and to be transd. to R.F.C. Gen. List; Dec. 19th, 1917. Temp. 2nd Lieut. (on prob.), Gen. List, and to be confirmed in their rank.—D. M. Clementz; Oct. 28th, 1917. W. J. O. Millett; Dec. 19th, 1917. A. E. Burton, W. W. Jones, W. R. Heaton, H. L. Whitton; Dec. 22nd, 1917. A. P. Atkins; (Dec. 23rd, 1917). H. J. C. Spencer; Dec. 27th, 1917. C. de B. Pequegnat; Jan. 5th, J. L. Waugh, F. B. Evans, S. McK. Litten; Jan. 18th, H. W. Smith; Jan. 19th, 2nd Lieut. (Temp. Lieut.) G. J. Scaramanga, N. Staff. R., S.R., sen. from Jan. 17th, 1916, but without pay prior to Nov. 15th, 1916.

Flying Officers (Observers).—2nd Lieut. W. R. Baker, Worc. R., T.F., and to be sec'd.; Aug. 11th, 1917, sen. Nov. 10th, 1916. Temp. Lieut. J. H. Robertson, Welsh R., sen. from Nov. 6th, 1917, and to be transd. to R.F.C. Gen. List; Temp. Capt. G. Murray, A.S.C., sen. from Nov. 12th, 1917, and to be transd. to R.F.C. Gen. List; Jan. 15th, 1917. Lieut. P. W. Booth, R.F.A., T.F., and to be sec'd.; Jan. 16th; sen. from Dec. 6th, 1917. Temp. 2nd Lieut. (on prob.), Gen. List, and to be confirmed in their rank.—F. G. Solis; Jan. 17th; sen. from Sept. 24th, 1917. F. M. Woolner; Jan. 15th; sen. from Nov. 4th, 1917. E. McL. Cleland; Jan. 16th; sen. from Nov. 12th, 1917. L. L. T. Slood; Jan. 15th; sen. from Nov. 20th, 1917.

Brigadier Instructor in Gunnery.—Graded as a Park Comdr.—Capt. H. E. F. Wyncoll, M.C., Notts and Derby R., from an Instr. in Gunnery (graded as an Equipment Officer, 1st Cl.), and to be Temp. Major whilst so employed; Jan. 19th.

Adjutant.—The appt. of Lieut. (Temp. Capt.) T. M. Eggar, London R., T.F., notified in the Gazette of Sept. 19th, 1917, is cancelled.

Equipment Officer, 2nd Class.—Qrmr. and Hon. Lieut. W. Batchelder, T.F. Res., from the 3rd Cl., and to be Temp. Lieut. whilst so employed; Dec. 10th, 1917.

General List.—Temp. 2nd Lieuts. to be Temp. Lieuts.:—C. D. Kirkbride, N. D. I. Gavin, A. H. Fitzmaurice, (Temp. Major) K. R. Binning, M.C., J. A. G. Swaine, S. O. Hillman, W. M. Pierce, M.C., R. W. S. Middleton (Temp. Capt.) S. G. Kingsley, M.C., N. S. Dougal, A. D. S. Catling, A. K. A. M. Buschmann, L. Clarke, (Temp. Capt.) I. G. Davies, G. R. Rowe, S. Seed, H. K. Knight, N. J. Brebner, H. J. Hanmer, E. L. Pratt, H. K. Budgen, G. H. C. G. Holt, H. G. Hall, A. A. Harcourt-Vernon, G. Cornwall, K. G. Sclanders, J. C. O. Nelson, G. E. Barnett, H. Faulk, H. D. A. Dart, G. W. Howland, W. R. Tate, H. A. Jones, M.C., H. Richard-de-Leschery, H. E. Kirk, H. V. Northam, G. A. Forrest; July 1st, 1917. E. C. Netherton; July 8th, 1917. R. S. Barbour; Aug. 18th, 1917. F. R. Hatch, B. J. Mitchell; Aug. 21st, 1917. W. J. Buchanan; Sept. 12th, 1917. N. A. Ayres; Sept. 13th, 1917. G. A. Binning; Sept. 23rd, 1917. C. E. Pither; Oct. 2nd, 1917. A. F. Ingram; Oct. 3rd, 1917. (Temp. Lieut.) L. H. Stowell, A. J. Court; Oct. 15th, 1917. R. V. Nalder; Oct. 22nd, 1917. J. B. Welman; Nov. 2nd, 1917. E. A. Gulson; Nov. 25th, 1917. F. W. J. Humphreys; Nov. 29th, 1917. S. L. Pope, (Temp. Lieut.) A. W. Smith; Dec. 3rd, 1917. N. K. Johnson, P. W. B. Lawrence; Dec. 10th, 1917. M. W. Dickens; Dec. 12th, 1917. E. Steadman; Dec. 17th, 1917. T. V. Brake; Dec. 23rd, 1917. V. A. Cooper; Dec. 27th, 1917. (Temp. Lieut.) D. C. Ellis; Jan. 7th. L. A. A. Bernard to be Temp. 2nd Lieut. (on prob.); Nov. 27th, 1917.

Supplementary to Regular Corps.—2nd Lieut. (on prob.) D. G. George is confirmed in his rank.

London Gazette Supplement, February 14th.

The following appointments are made:—

Flight Commanders.—Temp. Lieut. (Temp. Capt.) S. B. Smith, Gen. List, from an Equipment Officer, 2nd Cl., and to retain his temp. higher rank while so employed; Feb. 22nd, 1917. Maj. R. H. Howell, Ind. Cav., from a G.S.O., 3rd Grade, at the War Office; Jan. 24th; sen., Feb. 1st, 1917. Temp. 2nd Lieut. K. B. Montgomery, Gen. List, from a Flying Officer, and to be Temp. Capt. while so employed; Jan. 2nd. Temp. Capt. E. V. Longinotto, Gen. List, from a Flying officer; Jan. 28th.

Flying Officers.—Lieut. A. K. Matthews, R.A., and to be sec'd.; Oct. 26th, 1917. Temp. 2nd Lieut. J. E. Sitch, att'd. Worc. R., and to be transd. to R.F.C. Gen. List; Dec. 19th, 1917. Temp. Lieut. C. E. W. Lockyer, Gen. List, from a Flying Officer (Observer), sen. from Apr. 10th, 1917. 2nd Lieut. (Temp. Lieut.) T. S. Griffiths, R. Welsh Fus., and to be sec'd.; Dec. 21st, 1917. Lieut. C. B. Green, Cent. Ontario R., Canadian Exped. Force; Lieut. J. Racine, Hamps. R., T.F., and to be sec'd.; Lieut. E. A. B. Urmston, Lond. R., T.F.; Dec. 22nd, 1917. Lieut. A. E. de M. Jarvis, E. Ontario R., Canadian Exped. Force; Dec. 27th, 1917. Lieut. A. R. Croker, R.E., T.F.; Dec. 31st, 1917. Lieut. H. P. Smith, Bord. R., T.F., and to be sec'd.; Jan. 14th. 2nd Lieut. (on prob.) D. G. George, S.R.; Jan. 15th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank.—W. A. E. Pepler, F. A. Whittall; Oct. 4th, 1917. R. J. Finlay (since killed in aero. accident); Oct. 20th, 1917. C. T. Aluph; Oct. 21st, 1917. J. P. Fennelly, L. M. M. Browne; Nov. 11th, 1917. G. S. Wilkin; Nov. 13th, 1917. J. N. B. McKim; Nov. 16th, 1917. C. J. Gillan, A. McM. Phillips; Nov. 17th, 1917. T. Noad; Nov. 18th, 1917. E. J. C. Bockett; Nov. 22nd, 1917. L. W. Lowen; Nov. 23rd, 1917. G. D. Tod; Nov. 26th, 1917. B. A. de Nevers; Dec. 20th, 1917. A. P. Snelling; Dec. 22nd, 1917. A. H. Pownall; Dec. 25th, 1917. R. Douglas; Dec. 26th, 1917. R. J. Scott; Dec. 27th, 1917. R. K. Mackenzie; Jan. 12th. C. C. Ivens; Jan. 19th. The initials of Temp. 2nd Lieut. (on prob.) F. W. Lowen, Gen. List, are as now described, and not as in the Gazette of Oct. 17th, 1917.

Flying Officers (Observers).—Temp. 2nd Lieut. (Temp. Lieut.) J. S. Webb, D. of Corn. L.L., and to be transd. to R.F.C. Gen. List; Nov. 15th, 1916; sen. from May 12th, 1916. Dec. 1st, 1917, sen. from Aug. 18th, 1917.—2nd Lieut. J. B. Weiss, Lond. R., T.F., and to be sec'd.; 2nd Lieut. W. F. Woods, Lond. R., T.F., and to be sec'd.; Dec. 1st, 1917; sen. from Sept. 22nd, 1917.—2nd Lieut. T. Chilton, R.F.A., T.F., and to be sec'd.; 2nd Lieut. H. B. Mason, R.A., from Lieut., R.F.A., T.F., and to be sec'd. Temp. 2nd Lieut. W. T. Fraser, R.A., and to be transd. to R.F.C. Gen. List; Nov. 21st, 1917; sen. from Sept. 22nd, 1917. Lieut. C. E. Channing, A.S.C., T.F., sen. from Nov. 8th, 1917, and to be sec'd.; Lieut. J. D. Boyd, Br. Columbia R., Canadian Exped. Force, sen. from Nov. 11th, 1917. Temp. Lieut. R. G. C. Adams, Yorks. L.L., sen. from November 14th, 1917, and to be transd. from R.F.C. Gen. List; Jan. 19th. Temp. Lieut. W. M. Foster, Durh. L.L.; sen. from Nov. 15th, 1917, and to be transd. to R.F.C. Gen. List; Temp. Lieut. A. D. Tatham, R. Highrs. (since died of wounds), sen. from Nov. 16th, 1917, and to be transd. to R.F.C. Gen. List; Jan. 16th. 2nd Lieut. H. S. Clemons, A.S.C., and to be sec'd.; Jan. 19th. sen. from Nov. 28th, 1917. Sept. 24th, 1917, sen. from Aug. 18th, 1917.—Capt. W. G. B. Martin, M.C., Alberta R., Canadian Exped. Force; Temp. Lieut. J. C. Bulteel, R. Fus., and to be transd. to R.F.C. Gen. List; Capt. J. J. L. Williams, M.C., Yeo., T.F., and to be sec'd.; Nov. 30th, 1917, seny., Aug. 31st, 1917. 2nd Lieut. W. D. Robertson, R.E.; Dec. 18th, 1917, seny., Sept. 6th, 1917. 2nd Lieut. J. S. Jones, R.G.A., S.R.; Dec. 8th, 1917, seny., Sept. 6th, 1917. Lieut. T. J. R. Wilson, R.F.A., T.F., and to be sec'd.; Dec. 1st, 1917, seny., Sept. 30th, 1917. Lieut. D. H. Thomas, R. Welsh Fus., T.F., seny., Oct. 20th, 1917, and to be sec'd.; Lieut. J. Mackay, Arg. and Suth'd Highrs., T.F., seny., Oct. 27th, 1917, and to be sec'd.; Temp. Lieut. B. H. Cook, Gen. List, with seny., Oct. 30th, 1917 (Dec. 6th, 1917). Jan. 19th, seny., Nov. 11th, 1917.—2nd Lieut. C. L. Silvester, N. Staff. R., T.F., and to be sec'd.; Temp. 2nd Lieut. H. M. Tysoe, Res. R. of Cav., and to be transd. to R.F.C. Gen. List; 2nd Lieut. A. H. Clegg, W. Rid. R., T.F., and to be sec'd.; Jan. 19th, seny., Nov. 15th, 1917. Temp. 2nd Lieut. (Actg. Lieut.) C. R. Pilcher, R.E.; Jan. 20th, seny., Nov. 29th, 1917.

Assistant Instructors in Gunnery.—(Graded as Equipment Officers, 2nd Cl.)—And to be Temp. Lieuts. whilst so employed; Feb. 16th.—Temp. 2nd Lieut. L. M. Nava, Gen. List, from a Flying Officer (Obs.); Temp. 2nd Lieut. W. H. M. Groom, Gen. List, from an Asst. Instr. (graded as an Equipment Officer, 3rd Cl.).

Balloon Commander.—(Graded as a Balloon Officer.)—Temp. Lieut. C. H. Davies, Gen. List, from a Balloon Officer; Oct. 8th, 1917.

Adjutants.—Capt. T. B. Marson, Yeo., T.F.; Dec. 18th, 1917. Capt. C. J. Page, Lond. R., T.F., and to be sec'd.; Feb. 1st.

Park Commander.—Qrmr. and Hon. Lieut. (Temp. Capt.) W. J. Waddington, R.F.C., from an Equipment Officer, 1st Cl., and to be Temp. Major whilst so employed; Jan. 22nd.

Equipment Officers, 2nd Class.—Temp. 2nd Lieut. R. G. Fyfe, Gen. List, from the 3rd Cl., and to be Temp. Lieut. whilst so employed; Jan. 14th. Temp. Lieut. (Temp. Capt.) H. Fernihough, Gen. List, reverts from the 1st Cl., and relinquishes the temp. rank of Capt.; Jan. 20th, seny., Feb. 1st, 1917. 3rd Cl.—2nd Lieut. A. H. Simpson, Gen. List; Oct. 5th, 1917. Temp. 2nd Lieut. H. A. L. Way, Lab. Corps, and to be transd. to R.F.C., Gen. List; Nov. 1st, 1917. Temp. 2nd Lieut. F. Atkins, Gen. List; Dec. 1st, 1917. Temp. Lieut. D. R. Chalmers-Hunt, Gen. List; Dec. 31st, 1917. Temp. 2nd Lieut. (on prob.), Gen. List, and to be confirmed in their rank.—H. W. Nicholl; Dec. 1st, 1917. H. Stuart, O. G. Pike; Jan. 15th. W. E. Palmer; Jan. 17th. R. Swan, W. J. D. Partridge, C. L. Booth, J. T. C. Lovell; Jan. 21st.

Schools of Instruction.—Schools of Military Aeronautics. Instructor (graded as an Equipment Officer, 1st Class).—Temp. Capt. O. S. Mosley-Leigh, Gen. List, a Flight Comdr.; Dec. 5th, 1917.

General List.—Temp. 2nd Lieut. R. G. Fyfe, Gen. List, an Equipment Officer, 2nd Cl., to be Temp. Capt. whilst specially employed; Jan. 14th. Lieut. R. Saville, from R.N.A.S., to be Temp. Capt.; Jan. 16th. 2nd Lieut. F. Atkins, from R. Def. Corps, to be Temp. 2nd Lieut.; Dec. 1st, 1917.

London Gazette Supplement, February 15th.

Attached to Headquarters Units.

Brigade Commanders.—And to be Temp. Brig.-Gens. whilst so employed:—Capt. (Temp. Lieut.-Col.) C. L. N. Newall, Gurkhas, Ind. Army; Dec. 28th, 1917.

Military Wing.—The following appointments are made:—**Flight Commanders.**—From Flying Officers.—Capt. W. R. B. Gifford, Middx. R., S.R.; Jan. 8th. Capt. E. C. Stonehouse, A.S.C. (T.F.); Jan. 26th. And to be Temp. Capt. while so employed.—Temp. Lieut. P. G. K. Bridgwood, York and Lanc. R., and to be transd. to R.F.C. Gen. List; Temp. 2nd Lieut. C. J. S. Lea, Gen. List; Dec. 5th, 1917. Lieut. P. B. Pattison, S.R.; Jan. 21st. Temp. 2nd Lieut. F. Hobson, Gen. List; Jan. 26th. Temp. 2nd Lieut. I. W. Parnell, Gen. List; Jan. 30th. Temp. 2nd Lieut. D. L. Nutt, Gen. List; Jan. 31st. Temp. Lieut. T. K. Twist, Gen. List; Lieut. H. S. Marten-Smith, Lond. R. (T.F.); Feb. 4th. Temp. Capt. (Temp. Maj.) B. H. Turner, Gen. List, reverts from a Sqdn. Comdr., and relinquishes the temp. rank of Maj.; Jan. 27th, seniority July 31st, 1915.

Flying Officers.—Temp. 2nd Lieut. A. D. Taylor, Gen. List, from a Flying Officer (Obs.), seniority March 8th, 1917; Temp. 2nd Lieut. H. J. Bennett, Gen. List, from a Flying Officer (Obs.), seniority Jan. 14th, 1917; Jan. 5th. Lieut. F. L. Barclay, Cent. Ontario R., Canadian Exped. Force; Jan. 7th. Lieut. G. A. Barry, Quebec R., Canadian Exped. Force; Lieut. H. A. Driscoll, Manitoba R., Canadian Exped. Force, from a Flying Officer (Obs.), seniority Jan. 31st, 1917; Jan. 11th. Temp. Lieut. C. F. J. North, Gen. List, from an Equipment Officer, 1st Class, and relinquishes the rank of Temp. Capt.; Temp. 2nd Lieut. S. T. Payne, Gen. List, from a Flying Officer (Obs.), seniority Aug. 7th, 1916; Jan. 12th. Lieut. H. Perdeau, Quebec R., Canadian Exped. Force, from a Flying Officer (Obs.); Jan. 15th, seniority April 6th, 1917. Temp. Lieut. H. E. Bellamy, Gen. List, from a Flying Officer (Obs.); Jan. 16th, seniority Oct. 10th, 1916. Temp. 2nd Lieut. T. G. Rhodes, W. Rid. R., and to be transd. to R.F.C. Gen. List; Jan. 14th. Temp. 2nd Lieut. W. B. Giles, Gen. List, from a Flying Officer (Obs.); Jan. 21st, seniority Jan. 24th, 1917. Temp. 2nd Lieut. (on prob.), Gen. List, and to be confirmed in their rank.—F. C. Crummev, D. W. Gordon; Sept. 22nd, 1917. F. A. G. Bishop; Oct. 4th, 1917. J. M. Brown, L. H. Cunningham (since killed in aero accident); Oct. 13th, 1917. E. A. Burn; Oct. 21st, 1917. L. J. P. Roy; Oct. 23rd, 1917. D. T. C. Rundle-Woolcock; Oct. 26th, 1917, seniority (without pay prior to Oct. 26th, 1917) April 5th, 1917. A. W. Greene, E. F. Stein; Nov. 1st, 1917. W. H. Townsend, F. Westing, R. Willey; Nov. 3rd, 1917. B. I. Johnstone; Nov. 11th, 1917. E. J. Smith; Nov. 16th, 1917. C. A. McGillivray; Nov. 21st, 1917. J. H. Thompson; Nov. 23rd, 1917. L. L. Brennan; Nov. 25th, 1917. C. C. Conover; Nov. 30th, 1917. J. D. Anderson; Dec. 2nd, 1917.

C. J. Stanfield; Dec. 4th, 1917. V. Beecroft, P. H. Bell; Dec. 10th, 1917. W. Hodge; Dec. 11th, 1917. M. T. S. Papentus, O. Jones; Dec. 14th, 1917. R. F. Connack, C. F. Halford; Dec. 15th, 1917. W. Lamont; Dec. 24th, 1917. H. W. Campbell; Jan. 3rd. S. Sephton; Jan. 10th. L. H. Phillips; Jan. 12th. H. C. R. Conron; Jan. 14th. G. H. Langley; Jan. 15th. T. P. N. Alexander; Jan. 16th. G. F. Burns, H. E. Browne; Jan. 19th. R. W. Stobbart, F. O. Thornton; Jan. 20th. J. Bowley, E. R. Watt, E. Tasker, A. J. P. Wheeler, G. M. Atkinson, B. M. Bowyer-Smith, R. Chalmers, P. F. C. Howe, E. T. Hendrie; Jan. 21st. C. F. Russell; Jan. 23rd.

Flying Officers (Observers).—Lieut. P. Wood, R.G.A. (T.F.); July 10th, 1917, seniority March 14th, 1917. Lieut. K. Hall, R.G.A. (T.F.); Jan. 25th, seniority Oct. 11th, 1917. With seniority Oct. 18th, 1917:—Lieut. (Temp. Capt.) J. S. Gregory, A.S.C., S.R.; Jan. 24th. Lieut. J. L. P. Haynes, N. Lan. R. (T.F.), and to be secd.; Jan. 23rd. Temp. Lieut. A. W. J. Lyons, A.S.C., seniority Oct. 19th, 1917, and to be transd. to R.F.C., Gen. List; Lieut. J. E. M. Evans, Manch. R. (T.F.), seniority Oct. 23rd, 1917, and to be secd.; Jan. 25th. Lieut. T. W. Cave, R.F.A. (T.F.), seniority Oct. 25th, 1917, and to be secd.; Temp. Lieut. A. W. Matson, Bedf. R., with seniority Nov. 4th, 1917, and to be transd. to R.F.C., Gen. List; Jan. 24th. Temp. Capt. R. Lindsay, North'd Fus., and to be transd. to R.F.C., Gen. List; Jan. 23rd, seniority Nov. 15th, 1917. 2nd Lieut. W. Hart, Lond. R. (T.F.), seniority Nov. 29th, 1917, and to be secd.; Temp. Lieut. H. Fenton, S. Lan. R., seniority Dec. 1st, 1917, and to be transd. to R.F.C., Gen. List; Jan. 25th.

Balloon Officer.—2nd Lieut. E. J. Finch, Lond. R. (T.F.), and to be secd.; Jan. 23rd.

Equipment Officers, 2nd Class.—2nd Lieut. E. Porter, Som. L.I., from the 3rd Class, and to be Temp. Lieut. while so employed; Dec. 27th, 1917. 3rd Class. —Temp. 2nd Lieut. F. C. Lyne, Gen. List; Nov. 3rd, 1917. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—P. G. May; Dec. 14th, 1917. R. E. H. Martin, E. W. Braendle; Dec. 15th, 1917. J. J. Dwyer; Dec. 31st, 1917. J. Mackie; Jan. 7th.

Schools of Instruction.

Commandant.—(Graded as a Sqdn. Comdr.)—Capt. L. F. Richard, R.A., a Flight Comdr., and to be Temp. Maj. while so employed; Aug. 16th, 1917.

General List.—Temp. 2nd Lieuts. relinquish their commissions on account of ill-health contracted on active service, and are granted the hon. rank of 2nd Lieut.:—A. W. Clarke, O. M. Johns; Feb. 16th. The appointment of Temp. 2nd Lieut. H. J. Winton notified in the *Gazette* of Nov. 23rd, 1917, is postdated to Jan. 25th; R. Neill to be Temp. 2nd Lieut. (on prob.); Jan. 7th. Cadets to be Temp. 2nd Lieuts. (on prob.):—F. Masson; Jan. 27th. E. F. Adams, J. L. Airey, T. M. Alexander, C. Appleby, A. C. Baldwin, L. C. Band, W. I. Bannatyne, J. G. Barclay, H. F. V. Battle, S. H. Baynes, S. Beaumont, F. Belcher, H. G. Bennett, P. J. Cardell, A. H. Betteridge, R. Biggin, J. C. Boyle, J. Bradbury, T. G. Brooke, W. S. Brown, G. R. Butcher, J. G. Campbell, D. D. Carcary, S. L. Bennett, C. F. Cave, C. G. Churchill-Woodman, E. P. Clacey, C. R. Clarke, F. G. Clarkson, E. P. Collingburn, A. R. Collis, M. Cook, J. C. Cooke, D. G. Cooper, S. Cooper, T. Cooper, E. H. Covell, S. A. E. Cowell, G. Crusoe, C. H. Cutting, L. Dawson, L. C. S. Delapena, E. A. Devine, G. Dignam, S. J. A. Dods, W. E. H. Dymock, K. S. Eagles, B. M. Evans, W. R. Evans, J. Farquhar, L. W. Faucett, L. Fewkes, L. W. Foot, D. Forster, H. J. Foster, R. H. Fotheringham, S. Franks, J. C. Fraser, F. Frith, A. W. Garnett, C. A. J. Goodfellow, E. G. Grafton, H. A. Griffiths, T. W. Griffiths, H. J. Gye, R. W. T. Harrow, J. Harston, L. Hart, C. A. Harvey, L. C. Hatton, H. C. Hayes, J. W. Hill, F. A. Hinton, S. Hodges, J. Horton, J. A. Howard, J. Hunter, J. H. Huxley, C. F. W. Illingworth, A. G. Johnston, C. R. Jones, F. H. Joynes, C. Keene, H. C. Killen, F. W. King, C. G. Knowles, M. H. Levy, L. C. Lewis, D. L. Little, A. C. Macaulay, N. H. Marshall, A. G. Masters, R. G. McLaren, J. Miller, S. C. Millar, W. Mitchell, W. D. Moffatt, R. H. Morton, J. T. F. Neary, H. S. Neville, T. U. J. Nicholas, S. Nicholson, C. D. Notley, C. R. B. Ogden, W. J. O'Sullivan, J. E. Phelps, H. S. Philp, B. G. Pool, J. V. Price, T. A. Priestley, R. Ramsay, J. B. Rennick, G. Rowell, F. A. Russell, P. L. Sant, J. Scholes, J. W. Shaw, W. Shaw, S. T. Stidolph, J. S. Swales, D. S. Thomson, M. Thorley, A. H. Tilbury, S. B. Trites, G. M. Trundle, W. Tunnicliffe, C. Ward, H. D. Wardle, J. A. Watt, F. C. Wells, W. H. Whale, F. Whiskin, R. B. Wightman, F. S. Willisie, K. P. Window, R. J. Wood, J. P. Wotton, W. A. Youngman; Feb. 7th.

Supplementary to Regular Corps.—2nd Lieut. O. Lindquist to be Lieut. Jan. 7th.

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A.G.'s and Q.M.G.'s Staff.—D.A. and G.M.G.—Bt. Lieut.-Col. (Temp. Brig.-Gen.) F. H. Sykes, C.M.G., Hrs., and to retain his temp. rank whilst so employed; Nov. 27th, 1917.

Special Appointments.—(Graded for purposes of pay as a Staff Capt., whilst employed as a Squadron Comdr., R.F.C., Cadet Wing).—Temp. Capt. H. A. Drewe-Mercer, Gen. List; Oct. 9th, 1917.

The following appointments are made:—

Flight Commander.—Lieut. L. G. Paling, Notts and Derby R., S.R., from 2 Flying Officer, and to be Temp. Capt. whilst so employed; Feb. 2nd.

Flying Officers.—Lieut. G. Milner, R.E., S.R.; Oct. 1st, 1917 (substituted for the notification in *Gazette* of Dec. 15th, 1917). Temp. Lieut. B. W. Meadow, North'n R., and to be transd. to R.F.C., Gen. List; Jan. 14th. Temp. 2nd Lieut. L. R. Brereton, Gen. List, from a Flying Officer (Observer), seniority from

Jan. 2nd, 1917. Temp. Capt. R. Saville, Gen. List; Jan. 16th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—S. J. Allen; Nov. 4th, 1917. J. H. Smith; Nov. 10th, 1917. R. G. Reid; Nov. 20th, 1917. T. B. Jones; Jan. 14th. R. B. Donald, D. C. Inglis; Jan. 16th. A. A. Green; Jan. 19th. J. W. Chapman, J. McK. Nish, J. W. Gillis, G. Hudson, W. G. Peters; Jan. 20th. E. G. Macpherson, H. L. Jones; Jan. 22nd.

Schools of Instruction.—Schools of Aerial Gunnery.

Instructor.—Graded as a Flight Comdr.—Lieut. (Temp. Capt.) D. H. S. Davies, R. War. R., from an Instr. in Gunnery (graded as an Equipment Officer 1st Class), and to retain his temp. rank whilst so employed; Jan. 3rd.

Memoranda.—Sergt. C. Proberts, from R.F.C., to be 2nd Lieut. whilst serving with R.F.C.; Jan. 11th.

London Gazette Supplement, February 18th.

The following appointments are made:—

Squadron Commander.—Lieut. (Temp. Maj.) C. H. Nicholas, S. Wales Bord. S.R., from a special appointment (graded as a Sqdn. Comdr.), and to retain his temp. rank whilst so employed; Sept. 19th, 1917.

Flight Commander.—Lieut. (Temp. Maj.) K. T. Dowding, R. W. Surr. R. (T.F.), to revert from a Sqdn. Comdr., to relinquish his temp. rank, and to be Temp. Capt. whilst so employed; Jan. 19th, seniority May 22nd, 1916.

Flying Officers.—Lieut. S. H. Kerr, E. Ontario R. Canadian Exped. Force; Dec. 24th, 1917. 2nd Lieut. S. D. Lavelle, Manch. R., and to be secd.; Jan. 12th. 2nd Lieut. C. F. Lewis, R.F.A., S.R.; Jan. 18th. Capt. G. C. Easton, Manitoba R., Canadian Exped. Force, from a Flying Officer (Obs.), seniority from Nov. 25th, 1916. Lieut. F. V. Heakes, Cent. Ontario R., Canadian Exped. Force; Temp. Lieut. R. de R. Brett, Gen. List, from a Flying Officer (Obs.), seniority from March 8th, 1917; 2nd Lieut. A. H. Cooper, R. Sco. Fus. (T.F.), and to be secd.; 2nd Lieut. E. A. Sullock, L'pool R. (T.F.), and to be secd.; Jan. 21st. Lieut. O. Denman, E. Ontario R., Canadian Exped. Force; 2nd Lieut. S. A. Robinson, Bord. R. (T.F.), and to be secd.; 2nd Lieut. J. L. Gower, R.A., and to be secd.; Temp. 2nd Lieut. W. A. Amor, Gen. List, from a Flying Officer (Obs.), seniority from Jan. 24th, 1917; Jan. 22nd. 2nd Lieut. C. E. Everard, Essex R. (T.F.), and to be secd.; Jan. 25th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—A. M. Beamer; Sept. 22nd, 1917. R. T. Balch, G. F. Hubbard; Nov. 27th, 1917. B. K. Adams; Dec. 14th, 1917. H. W. Watts; Dec. 16th, 1917. C. G. Catto, G. J. Glazier, A. L. Davies; Jan. 17th. J. W. Andrews, L. C. Walker, G. L. Blake; Jan. 18th. J. W. Kavanagh; Jan. 19th. A. R. M. Henderson, G. Nash, F. G. Pym, W. Gardner, A. J. B. Meikle; Jan. 21st. G. L. du Cros, A. T. Reeve, A. B. Holden, F. N. Katzin, A. G. H. Lane, J. V. McDonald; Jan. 22nd. A. C. R. Hawley, G. Ezard, W. H. D. Knight; Jan. 23rd. M. Corrie, F. D. Shreeve, J. B. Bennett, J. J. McDonald; Jan. 24th. H. R. Little, C. E. H. Allen, C. Miller, J. P. Naish, D. E. Smith; Jan. 25th. A. F. Turnbull; Jan. 26th.

Flying Officers (Observers).—Seniority from Nov. 15th, 1917:—Lieut. W. J. Harvey, R. Dub. Fus., S.R., and to be secd.; Temp. 2nd Lieut. F. O. Rooks, R. War. R., and to be transd. to R.F.C., Gen. List; Jan. 27th. Lieut. G. J. R. Potter, R.F.A. (T.F.), and to be secd.; Jan. 26th, seniority from Nov. 20th, 1917. Temp. 2nd Lieut. (on prob.) L. M. Fenelon, Gen. List, seniority from Nov. 27th, 1917, and to be confirmed in his rank; Jan. 27th. Seniority from Dec. 11th, 1917:—Lieut. L. S. Birbeck, M.C., W. York. R. (T.F.), and to be secd.; 2nd Lieut. W. Pope, R.A.F., S.R.

Assistant Instructor in Gunnery (Graded as an Equipment Officer, 3rd Class).—The rank of Capt. T. N. Weguelin, Hamps. R. (T.F.), is as now described, and not as in the *Gazette* of Oct. 19th, 1917.

Adjutant.—Temp. Lieut. G. W. Beor, Res. Regt. of Cav., to be transd. to R.F.C., Gen. List, and to be Temp. Capt. (with pay and allowances as Lieut.) whilst so employed, vice Lieut. L. A. K. Butt, S. Staff. R.; Jan. 24th.

Park Commander.—Lieut. (Temp. Capt.) J. L. Luntley, S.R., from an Equipment Officer, 1st Class, and to be Temp. Major whilst so employed; Jan. 26th.

Equipment Officer, 3rd Class.—Temp. 2nd Lieut. (on prob.) H. Pollard, Gen. List, and to be confirmed in his rank; May 21st, 1917.

General List.—Temp. 2nd Lieut. W. C. Smith relinquishes his commission on account of ill-health contracted on active service, and is granted the hon. rank of 2nd Lieut.; Temp. 2nd Lieut. G. P. Hoyle resigns his commn.; Feb. 19th. The name of Temp. 2nd Lieut. (now Temp. Capt.) Cyril Stone Danby is as now described, and not as in the *Gazette* of Oct. 16th, 1914, and subsequent *Gazettes*. To be Temp. 2nd Lieuts. (on prob.):—Pte. E. Volke, from Canadian A.S.C.; Jan. 15th. 2nd Class Air Mech. H. L. Copestake, from R.F.C.; Actg. Corp. W. Foster, from R.F.C.; J. H. Jennings; Sergt. J. H. Reynolds, from R.F.C.; Petty Officer J. N. Yuille, from R.N. Armoured Car Div.; Jan. 28th. Temp. Sergt.-Maj. G. H. Davis from R.F.C.; 1st Class Air Mech. R. J. Hibberd, from R.F.C.; Jan. 31st. Cadet A. Scott, from R.F.C.; Feb. 16th. Cadets to be Temp. 2nd Lieuts. (on prob.):—H. Alcock, C. P. Bertoli, E. Hemsley, G. C. Rogerson, G. L. Ross, W. F. M. Wise; Feb. 2nd.

Memorandum.—Capt. S. J. Hutchinson, Lond. R. (T.F.), an Equipment Officer, 3rd Class, is secd. for duty with R.F.C.; May 9th, 1917.

Aeronautical Inspection Department.

London Gazette Supplement, February 14th.

To be Temp. Hon. Lieutenants.—Whilst employed as Asst. Inspns., Aeronautical Inspn. Dept.:—H. Clarke, C. Stevens; June 1st, 1917. G. Clempson; Aug. 1st, 1917.



"SPEED."*

By Lieutenant-Colonel MERVYN O'GORMAN, C.B., B.Sc.

THE essential idea of speed is that of performance within a fixed period of time. There is a strange wisdom hidden away in the bosom of the crowd. It is hard to sift, impossible to analyse or state logically. The common man knows that there are certain things which he wants and which he will have. These instincts can be observed if they cannot be explained or excused, and one of these instincts relates to time. It is the desire to achieve—during the strictly limited interval of time called life. In this way a time element which we call a rate of performance is introduced into all our intentions. We can desire that a thing shall occur in time, *some day*, but we desire it more forcibly if it can occur in our own time, during our span of life, and as our desires are many, if we are real live beings we find ourselves crowding things or wishful to crowd things within our span of time.

This reduces itself to an observation of the fact that man desires *speed*. If a thing happens speedily, it happens to us while we are still the same unaltered selves. If it happens

* Abstract of a lecture given before the Women's Institute.

tardily we know by experience that we have changed—that that wished it may wish it no longer, or if we still wish it, the savour has passed. In this way, or in some such way, is our desire for speed explainable. Unconsciously the crowd presses upon its slaves, the men of science and of engineering and of thought, for speed. We like to speed to our daily task, we prefer to complete it soon that we may speed back to our homes, our hobbies or our repose. The sailing boat made room for the steamer, the steamer for the speedier liner on the score of speed, not for the sake of economy and certainly not for comfort in the earlier days of each development. The coach yielded to the locomotive, the locomotive to the motor car and the car will yield to the aerial machine. This yielding has not been by disappearance of the earlier device, but by the addition to our mode of living of those features in which the new vehicle is found speedier than the other. It is to be noted that, in its beginnings at least, each new and speedier kind of transport vehicle was less luxurious than the last, and that the comforts which were superadded

came after the vehicle had won its place on the merit of its speed.

I do not defend this wish for speed, I note it, and if I have noted it correctly one is entitled to use this observation in considering the probable activities of men in the future. We see that the aeroplane can give speed in two ways. Not only can it move more rapidly than any other vehicle, but it can, owing to the homogeneous medium which it uses, and the immense depth of the free air, move more directly from place to place than any other conveyance. This doubly shortens the time expended in transit when we compare it to the motor car, even if roads were safe for travel at the 150 m.p.h. which the aeroplane now covers. Moreover, there will be certain occasions when a helping wind will give the aeroplane 200 m.p.h. over the ground.

Speed is measured in miles per hour, but it is valued in hours gained. If a day can hold more of life than we have hitherto considered it to be worth, then we rejoice; we repeat the effort until it is a commonplace and once more look out for another means of "speeding." "Speeding," if I may use that crisp American expression, is a habit, and a habit by its gratification does not as is commonly supposed afford content, it merely removes a distracting *malaise*. When one *malaise* is removed we are freed from the distraction to note another, and so the pursuit of satisfaction continues. There follows from this a sequence of changes, combined with partial repetitions, which are well typified by a spiral. This change is frequently called, and sometimes is, in fact, progress. In the case of introducing speed into human life I incline to think that the changes effected make for good and to regard the spiral as an ascending rather than as a descending stairway.

Why should we excuse a desire for speed, any more than a desire for music, or for children? We know that the animals are envious of each other's speed, that they will often run to beat simply because they see another running. So it seems the spirit of the aeroplane was pressing irresistibly and unresisted against the portals of human life long before man used this engine of war. War has helped. When a technical operation has become possible, the union of brains with means and intention which a great war seems to evoke and direct, has often brought such technics into practical shape. I think it has once more served man's turn for speed.

It was war that introduced the age of steel. It was the study of armoured ships that produced the science of steel, and therefore also the speeding up of life which steel has brought to us, whether we consider the sewing machine, the motor car, the daily press or the Atlantic liner. War now gives us, as a bye-product of its murder factory, certain other things which we desire—one of these conduces to speed of communication and transit. Once the mechanism exists no logic will contend against such a rooted desire as that for speed, and I am by no means clear that there are any premises on which to found a logical objection. Those who are sensitive to calls of this sort are in the movement of life, those who are inert are stuck in a backwater. There are backwaters and eddies and counter currents, to great rivers; we expect them, we do not trouble to wash them away. The river flows on. There is no need to eulogise speed, but I would invite you to agree that its call is insistent.

Observation shows that there is a tendency to apply tests and amongst others one kind of erroneous test of utility to the future prospects of a technical development. This erroneous test is expressed by the question "What amongst to-day's well-known doings will be deteriorated or improved by your proposed design or mechanism?" Thus it was thought that the railway would displace the horse and ruin the carter (not to mention the landed proprietor). Railways did nothing of the kind, they increased the demand for horses and carts. In the pre-railway days the transfer of thousands of tons of goods in all directions at twice coaching speed was not so much thought of as to inspire even a wish or a hopeful inquiry. Yet now the absence of railway facilities is a sign of poverty and backwardness and is often a token of periodic starvation.

The motor car was decried as exclusively a rich man's special train or his juggernaut. "Who rides in the juggernaut now?" and is not its particular value due to its independence of rails and special roads?

There are signs that the development of aerial traffic will be treated with a more understanding spirit than was shown to the railway and the motor car. We are a trifle more circumspect about enforcing the test of the last paragraph. We hesitate to restrict or define the economical and political consequences of a new ability to move people and things at 150 or 200 m.p.h.

We shall find that the rapidity with which persons will

in the future be conveyed by aircraft will go one step further towards improving the harmonious structure of our larger communities of to-day. They will increase the degree of personal contact possible and so conduce to peace.

The Sensation of Speed.—An analysis of sensation is always interesting and might be expected to be exceptionally so in the case of speed, yet paradoxically enough there is no such thing as a sensation of speed. There are many proofs of this, but I will adduce for one, that for the early centuries of human existence man, though he has since been proved to be moving through space at the prodigious speed of some thousands of miles per hour, thought himself to be living on the immobile hub of a rotating dome of moving planets and stars.

What then is it that we feel when we are moved rapidly by an aeroplane? The answer is the *illusion* of speed, inspired by a summation of sensations which we have the habit of associating with rapid motion. This illusion can easily be induced without moving the man, and it has often been done, for example, at one of the Earl's Court exhibitions a passenger trolley on a few feet of rails was arranged at the centre of a large room of which the walls and ceilings were mounted so as to be bodily rotated round the trolley. The trolley was given a little jerk to convey the impression of a starting acceleration (I will revert later to the subject of acceleration) and then as the trolley became stationary the room was made to turn at an increasing speed round the experimenters, who suffered from the conviction that they were travelling on smooth rails at a high speed.

Our impression of speed is derived largely from the optical effect, due to adjacent objects flitting by, and is increased by a surface or skin effect due to the wind which brushes past us and cools and presses on to our persons. These two effects are sufficient, but the impression is heightened by going yet a little further. Our past experience of most mechanical and animal means by which we have borrowed speed has shown us that they are rarely if ever perfectly smooth in their action. After the change of speed due to the starting operation there are slight irregular changes of speed and changes in the direction of the movement. These are always associated with rapid travelling; we call them jolts and jars if they are severe, and we wrongly regard them as part of the sensation of speed, though they are pure accidentals. They ought properly to be called *accelerations*, and the act of starting is the only acceleration which is in fact necessary to obtain speed. Yet a fourth factor can be detected in many of our impressions of speed. I allude to noise, whether of whistling wind or of beating hoofs or of moving machinery. These things no more constitute a sensation of speed than the bristles constitute a hedgehog. They are merely excrescences and causes of independent sensation. At one time or another an aeroplane flight gives rise to all these sensations to an acute degree, and super-adds one novelty, that of the point of view.

Acceleration.—There is but one way of accelerating a body, and that is by applying a force (a push or pull) to it, and we have through our senses the means of knowing that a force is being applied to us. Consequently we are definitely conscious of acceleration even should we happen to be sheltered from the effects of the wind, or be unable to see out or hear or feel surrounding objects. This is in contrast with our inability to detect uniform motion without external evidence. I repeat that without such evidence we can have no certainty that we are moving. It is true that under the influence of habit we often forget to notice a *force* which acts upon us. In our new method of travel, by aircraft, owing to the fluid medium through which we move, it may be possible to achieve immense speeds without introducing intense sensation. It may safely be said that the hasty contentions which a certain French doctor of medicine upheld at the Automobile Club in 1900 as to the ultimate limit of speed at which man can travel through the air (200 kilometres per hour) are definitely to be regarded as disposed of by experiments. There is as yet no limit to be set to aircraft speed from the point of view of sensations or physical effects on the man. Experience, moreover, shows that sea-sickness due to bumps in the air is of remarkably unusual occurrence even at the utmost speeds known.

The place of modern aircraft speeds, in contrast with other more familiar speeds, is shown by the following table of rough approximates. When the wind is still or is favourable aircraft is easily first as movers of persons; with antagonistic winds they are still at about the level of the fastest car or train, and given that the passengers will be enclosed against exposure and also to protect them from noise, they afford by far the easiest, smoothest and the most attractive method of travel.

Table of Speed of

1. Light and the electric telegraph, 186,000 m.p.s.
2. Shell near the muzzle of 6-in. gun, 2,500 f.p.s.
3. Shell from 75 mm. gun, 1,600 f.p.s.
4. Sound, 1,100 f.p.s.
5. Revolver bullet near the muzzle, 500-800 f.p.s.
6. Tip of the blade of an airscrew, 600 f.p.s. or 400 m.p.h.
7. A fast aeroplane through the air, 150 m.p.h.
8. A fast aeroplane with a high wind, 200 m.p.h.
9. A fast car, 120 m.p.h.
10. An express train, 80 m.p.h.
11. A fast steamship, 40 m.p.h.
12. A bicycle (pedalled), 32 m.p.h.
13. A race horse, 30 m.p.h.
14. A man skating (for a mile), 24 m.p.h.
15. A man running (100 yards), 20 m.p.h.
16. A man running a mile, 13 m.p.h.
17. A man walking, 4 m.p.h.

There exists to day no aircraft transport and travel, all that can be said of it is hypothesis or fancy or hope. Having seen war aircraft where they are we know that an economic and political case exists for it. We expect opposition. There will be a fatigue reaction after these strenuous times. There will be a tendency to clog the world's affairs with the heavy grease of bureau management under guise of lubricating them in the common interest. Certain folks will begin to think themselves old and wise and soaked in experience through the home trials caused by war. I cannot see a body of old and wise developing aircraft travel nor a number of energetic young men and vigorous individuals failing to do so. There will be a tussle. State control with slumber and safe salaries will make an excellent showing of safe arguments against personal initiative, and the prick of profits and the risk of ruin. If aircraft transport and travel fails to arrive it will not be from technical or financial, but because of political difficulties.

Let us take the hopeful view. It is remarkable that it is not only glorious but also advantageous to excel, to do that which we do with all our might. Since we must fly,

let us fly as well as man can fly, let us put our backs into it. We rarely pause to consider whether we are justifying our title to be a great and ruling nation—but we know in our souls that if we do not justify our title we shall cease from ruling. We shall decay and someone else whose standard is higher, whose courage is higher, whose enterprise is higher, and whose life is more vigorous and effective will jog us painfully into the path which we ought to have chosen, so that we shall still tread it, but in tribulation and weeping instead of feeling ourselves masters of our fate. It would seem that speed of travel provides far more than merely the crowding of activities into the span of life, it may if suitably used tend to alter the whole character of human relationships, to increase the completeness of mutual understanding.

Basing ourselves on the world desire that we should establish and keep friendly relations with larger and larger agglomerates of men, it is legitimate to ask whether there is any other suggestion for securing the fulfilment of this desire so far-reaching as the seemingly dry and technical proposal of this lecture, "speed." Community of language is but partially effective till contact has been established. It is to be doubted whether friendliness can take its basis in commercial competition, save in so far as commercial relations are an incentive to contact and intercourse. It is to be doubted whether friendliness can be based on an appreciation of the logical strength of another's position, or of another's exalted ethical standard. It is trite to say that the vital agent of concord is love, but it does not seem to have been so often said that to love distant peoples speed of access to them and frequent and easy access to them is absolutely essential. Understanding which arrives too late may beget forgiveness, if only it arrives soon it may induce approval or unanimity. The interval of time during which bitterness would have arisen can only be swallowed up through the agency of speed. The apparently quite unessential fact that man can freely fly at 150 or 200 miles an hour may affect that vital side of life which we are wont to call sentimental, and which is none the less important in England where we pretend out of some obscure shyness to disregard sentiment.

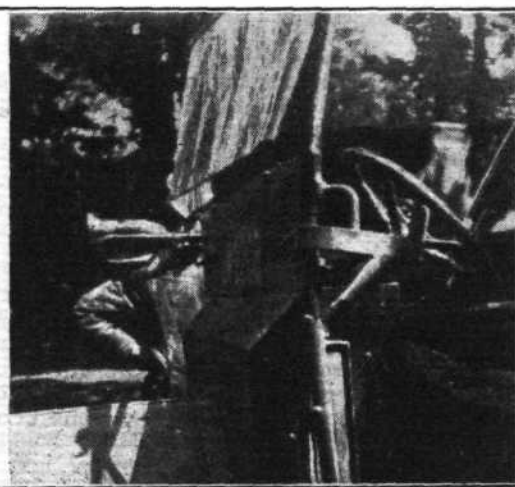
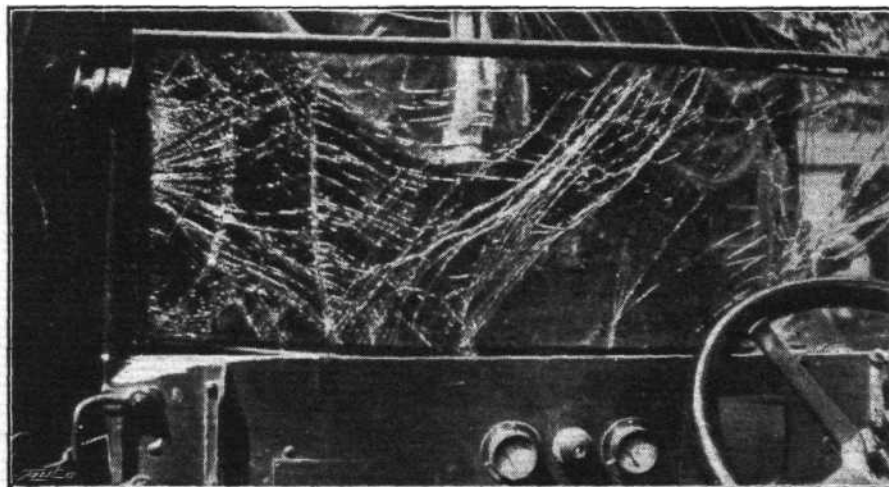
SIDE-WINDS.

A RUMOUR appears to have been widely circulated to the effect that Auto-Carriers, Ltd., is about to be amalgamated with a large firm engaged in Government contracts. We have been requested by the company to deny the statement, which is wholly unfounded, no move in the direction suggested being in contemplation.

INTERNAL reorganisation of the works of Messrs. G. W. Pearce and Sons, Ltd., has led to their postal address being changed to Whitehouse Street, Aston, Birmingham, to which all correspondence should be addressed in future. Goods and empties should still be sent to Chester Street, Birmingham. The telephone call is East 847 and 848.

MODELS of every kind, and especially those which are capable of working, are a never failing source of interest to

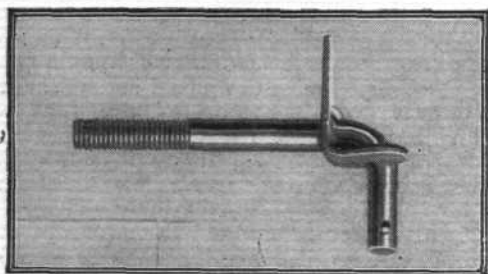
almost everyone, and for that reason alone the exhibition of models and war relics which is now being held in the show-rooms of Messrs. Thos. Parsons and Sons, Ltd., the well-known varnish and colour manufacturers, at 315-317, Oxford Street, W. 1, is well worth a visit. Apart from that, however, the firm have lent their showrooms to the War Seal Foundation, and the small charge made for admission goes to swell the funds of that excellent institution which is doing such splendid work for discharged soldiers and sailors. There are models in almost endless variety comprising warships, liners, locomotive engines, &c., while aircraft are well in evidence, among the firms who have contributed to this side of the exhibition being Avro, Blackburn, Grahame-White, J. Samuel White, Vickers, &c. Doubtless there are many more firms who have models of their productions who would be willing to lend them to make the exhibition even more com-



A SMASH AND A MORAL: USE TRIPLEX GLASS.—Our photographs show an R.F.C. car which got into trouble, a saving clause against worse injury to the occupants being found in the Triplex glass windscreen. The 1st A.M., who was driving, writes: "Two of our fellows were badly hurt in this smash, but what would have happened if ordinary glass had been used in the windscreen I do not know. No glass left the frame, and, as shown in photograph No. 2, it actually bent. Note the passengers' seat, or, I should have said, the seat where the passengers sat. The motor skidded and knocked a lamp-post down."

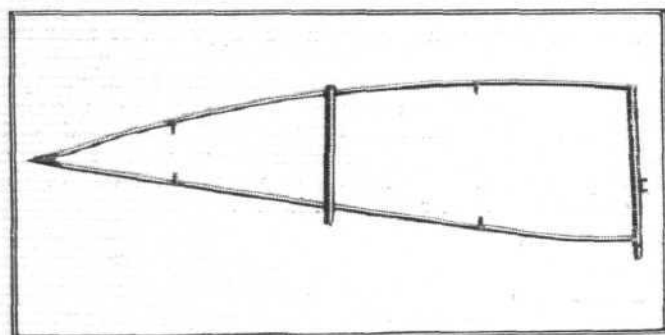
plete, especially in view of the cause in aid of which it is being held. Any assistance in this direction will be gladly welcomed; every care will be taken of the models, which will be returned at the close of the exhibition.

CONTINUED success of the Aeroparts Manufacturing Co., with Mr. Fred Coulson at the helm at 166, Piccadilly, has necessitated further manufacturing facilities in order to meet the demand for metal fittings and parts. Mr. Coulson is a great believer



A hinge pin, one of the specialties of the Aeroparts Manufacturing Co.

in concentration of effort, and one fitting in which the firm specialises is the hinge-pin shown in the accompanying photograph. Another branch of the business in which fine progress has been made is that dealing with tube work, and a specimen



A sample of the Aeroparts Manufacturing Co.'s tube work—a fin framework.

of their productions—a fin framework—is seen in the second photograph. The firm have laid themselves out to make all parts built up of tubes such as fins, pylons, struts, &c., and, in this connection, have carefully trained a special staff in the art of welding.

It should be noted that Hangar Fittings, especially those for the Bessonneau Hangar, Type C, are a speciality of the Skerne Works, Ltd., Darlington.

THE Nottingham Aircraft Manufacturing Co., Ltd., announce that the address of their headquarters is now Castle Meadow Road, instead of 32, King Street, as hitherto.

PROBABLY many visitors to the Imperial War Exhibition at Burlington House in the early days failed to notice anything novel about the exhibit which was described as a Calthrop "Guardian Angel" Parachute. Owing to an unfortunate mistake an ordinary Service parachute was shown in the place of the Calthrop. This has been rectified, and visitors to the exhibition now have an opportunity of studying the extraordinary merits of the "Guardian Angel" parachute.

THE Trade Marks Committee of the Federation of British Industries has decided to oppose Part 2 of the proposed new Government Bill "To Amend the Trades Marks Act 1905," on the ground that it will inflict serious injury on the owners of perfectly legitimate trade marks. Part 2 deals with "Provisions for the Prevention of Abuses of Trade Marks." It has also been decided by the same Committee that the proposed British Empire Trade Mark should be opposed.

RECOGNISING that radiator shutters are likely to be one of the big demands of the immediate future, the Pulvo Engineering Co., Ltd., of Dane Street, Holborn, W.C. 1, are laying themselves out to specialise in this branch of the work, and have just taken additional premises for making shutters throughout. This will obviate any interference with the manufacture of small metal fittings and parts which is still such a large part of their business.

NEW COMPANIES REGISTERED.

CAMDEN CONSTRUCTION CO., LTD., 90, Cannon Street, E.C.—Capital £2,000, in £1 shares. Manufacturers of and dealers in aeroplanes, airships, balloons, &c.

SIDNEY DAVIDSON BALLOON CO., LTD., Lonsdale Road, West Kilburn, N.W.—Capital £4,000, in £1 shares. Acquiring the business of manufacturers of and dealers in balloons and lighter-than-air craft of all kinds and component parts therefor formerly carried on by S. Gluckstein, S. H. Gluckstein, W. E. Chester, and P. L. Mott, as the "Sidney Davidson Balloon Co.," at Lonsdale Road, West Kilburn. First directors: S. Gluckstein, S. H. Gluckstein, W. E. Chester and P. L. Mott.

INTERNATIONAL AIR TRANSPORT CO., LTD., 34, Waterloo Street, Birmingham.—Capital £2,000, in £1 shares. Carriers of passengers and goods by land, air or sea, manufacturers and hirers of airships, aeroplanes, balloons, hydroplanes, &c.

MALDEN ENGINEERING AND AIRCRAFT EQUIPMENT CO., LTD., College Works, Malden Road, New Malden, Surrey.—Capital, £3,000, in £1 shares (2,900 7½ per cent. cumulative preference). Manufacturers of and dealers in aircraft and motor parts, aeronauts' clothing, &c. First directors:—W. Hinds, T. H. Hellyer and C. Hellyer.

BUSINESS NAMES REGISTRATIONS.

SIR J. H. BILES AND SON.—Registered, December 14th, 1917. Aircraft manufacturers. Hamworthy, Poole, Dorset. Partners: (1) Sir John H. Biles, Kt. (British), 6, Palace Court Chambers, W.; (2) John H. Biles, Jun. (British), 28, Park Drive, Hampstead, N.W.

IMPORTS AND EXPORTS, 1917-1918.

AEROPLANES, airships, balloons, and parts thereof (not shown separately before 1910). For 1910 and 1911 figures see "FLIGHT" for January 25th, 1912; for 1912 and 1913, see "FLIGHT" for January 17th, 1914; for 1914, see "FLIGHT" for January 15th, 1915; for 1915, see "FLIGHT" for January 13th, 1916; for 1916, see "FLIGHT" for January 11th, 1917; and for 1917, see "FLIGHT" for January 24th, 1918.

	Imports.		Exports.		Re-Exportation.	
	1917.	1918.	1917.	1918.	1917.	1918.
January...	10,842	49,402	67,033	24,765	—	—

Aeronautical Patents Published.

Applied for in 1917.

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